

حمل الآن

مجانا وحصريا

المراجعة رقم (1)

اختبار شهر مارس



Model (1)

15
Marks

1 A) Complete the following sentences:

- 1 The noise intensity is measured in, while the sound intensity is measured in
- 2 Energy of a photon =

B) Give a reason for:

- 1 A partially immersed pencil in water appears broken.
.....
.....
- 2 Sound intensity in the case of the presence of carbon dioxide gas as a medium is higher than that in case of air.
.....
.....

C) What is meant by ...?

- The absolute refractive index of glass = 1.5.
.....
.....

2 A) Cross out the odd word:

- 1 Amplitude – Frequency – Density of the medium – Wind direction. (.....)
- 2 Skin – Leaves – Wood – Glass. (.....)

B) Define each of the following:

- 1 Light reflection:
- 2 Light intensity:

C) Calculate the frequency of a musical tone similar to the frequency of a produced tone using savart's wheel rotated with a velocity of 960 cycles in two minutes, given that the number of teeth of the gear is 30 teeth.

.....
.....

Model (2)

15
Marks

1 A) Choose the correct answer:

- 1 A sound wave with a frequency of 200 Hz than a sound wave with a frequency of 100 Hz.
 - (a) is high-pitched
 - (b) is more rough
 - (c) has more quality
 - (d) has less intensity
- 2 Light is refracted as its changes when it passes through different transparent media.
 - (a) frequency
 - (b) velocity
 - (c) quantity
 - (d) All the previous answers

B) What happens if...?

- 1 The distance between a light source and a surface is doubled. (In terms of light intensity)

.....
- 2 A light ray travels from air to water.

.....

C) Mention the use of:

- Glass prism:

2 A) Put (✓) or (×):

- 1 The light rays refract far from the normal when it passes from glass to water. ()
- 2 By increasing the thickness of a transparent medium, the quantity of light passing through it increases. ()

B) Compare between each of the following:

1

P.O.C	Noise	Musical tones
Frequency

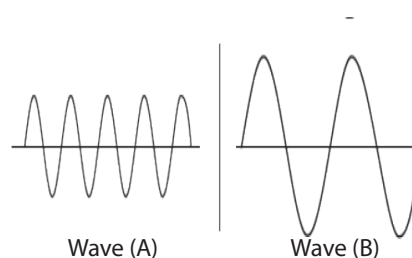
2

P.O.C	Fundamental tones	Harmonic tones
Sound intensity

C) Look at the opposite figure, then answer:

- Which wave has the highest pitch, and which one has the highest intensity?

.....



Model (3)

15
Marks

1 A) Write the scientific term:

- 1 The tones that accompany the fundamental tone, but they are higher in pitch and lower in intensity. (.....)
- 2 It is the ability of the transparent medium to refract light. (.....)

B) Give a reason for:

- 1 The absolute refractive index of any transparent medium is always greater than one.
.....
.....

- 2 The voice of women is sharper than the voice of men.
.....
.....

C) Calculate the velocity of light through glass, if the velocity of light through air is 3×10^8 m/s and the absolute refractive index of glass is 1.5.

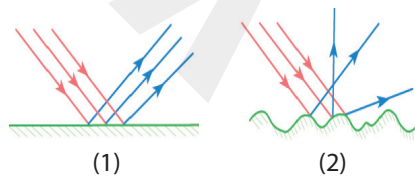
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2 A) Choose the correct answer:

- 1 Light is responsible for the formation of inverted images when rain falls.
(a) reflection (b) velocity (c) refraction (d) quality
- 2 The resonance box the intensity of sound.
(a) decreases (b) increases (c) reduces (d) doesn't change

B) Look at the opposite figure, then answer:

- 1 Identify the type of reflection in each figure.
.....
.....



- 2 State the type of surface responsible for each type of reflection.
.....
.....

C) What is meant by ...?

- The angle of emergence in a prism is 40° .
.....
.....

Model (4)

15
Marks

1 A) Complete the following sentences:

- 1 A vibrating tuning fork produces tone.
- 2 The color has the longest wavelength, while the color has the shortest wavelength.

B) What happens when ...?

- 1 The length of the vibrating string decreases. (In terms of sound pitch)
.....
- 2 A light ray falls perpendicular to the interface between two different media.
.....

C) Compare between ...:

P.O.C	Transparent medium	Translucent medium
Permission of light

2 A) Correct the underlined words:

- 1 The light rays that falls perpendicular to the interface reflects at 90 degrees. (.....)
- 2 The light intensity is inversely proportional to half of the distance between the light source and the surface. (.....)

B) What is meant by ...?

- 1 The distance traveled by light in a time of 5 seconds equals 15×10^8 meters.
.....
- 2 The angle of refraction of a light ray is 50° .
.....

C) Savart's wheel rotates with a rate of 300 cycle per minute. A sound of frequency 600 Hz is produced when an elastic plate touches the teeth of one gear. Calculate the number of the teeth of the gear.

.....

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Model (5)

15
Marks

1 A) Put (✓) or (×):

- 1 When a light ray falls on a rough surface, it reflects in one direction. ()
- 2 The velocity of light increases by increasing the density of medium. ()

B) Give a reason for:

- 1 The piano sound differs from that of the violin even if they have the same intensity and pitch.

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- 2 The energy of green photon is larger than the that of yellow photon.

.....

C) Explain how mirage phenomenon occurs.

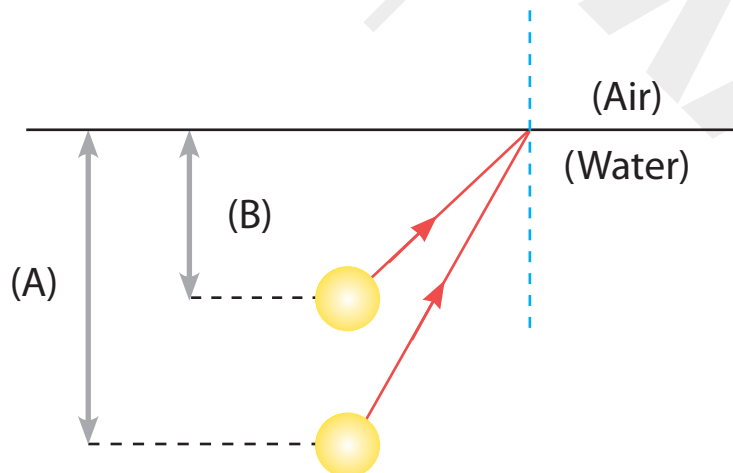
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2 A) Complete the following sentences

- 1 The sound of a lion is, so it is said that it has a-pitched sound.
- 2 Light travels through media in lines.

B) Look at the following figure, then answer:



1 Complete the path of the light rays through which the eye can see the coin inside the water.

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.....

.....

2 What are positions (A) and (B) called?

.....

.....

C- Mention one use for:

- Ultrasonic waves in the medical field:

.....

Model (1)

15
Marks

1 A) Complete the following sentences:

- 1 The noise intensity is measured in **decibel**, while the sound intensity is measured in **watt/M²**.
- 2 Energy of a photon = **Planck's constant × Photon frequency**.

B) Give a reason for:

- 1 A partially immersed pencil in water appears broken.
- **Due to the refraction of light rays coming from the immersed part in water.**
- 2 Sound intensity in the case of the presence of carbon dioxide gas as a medium is higher than that in case of air.
- **Because the density of carbon dioxide gas is more than that of air since the intensity of sound is directly proportional to the density of the medium.**

C) What is meant by ...?

- The absolute refractive index of glass = 1.5.
- **This means that the ratio between the velocity of light through air to that through glass is 1.5.**

2 A) Cross out the odd word:

- 1 Amplitude – Frequency – Density of the medium – Wind direction. **(Frequency)**
- 2 Skin – Leaves – Wood – Glass. **(Glass)**

B) Define each of the following:

- 1 Light reflection: **It is the rebounding of the light waves in the same medium on meeting a reflecting surface.**
- 2 Light intensity: **It is the quantity of light falling perpendicular to a unit area of a surface in one second.**

C) Calculate the frequency of a musical tone similar to the frequency of a produced tone using savart's wheel rotated with a velocity of 960 cycles in two minutes, given that the number of teeth of the gear is 30 teeth.

- **Time (t) = 2 × 60 = 120 seconds**

$$\text{Frequency (F)} = \frac{\text{No. of cycles (d)} \times \text{No. of gear teeth (n)}}{\text{Time in seconds (t)}} = 240 \text{ Hz}$$

Model (2)

15
Marks

1 A) Choose the correct answer:

- 1 A sound wave with a frequency of 200 Hz than a sound wave with a frequency of 100 Hz.
 (a) is high-pitched (b) is more rough
 (c) has more quality (d) has less intensity
- 2 Light is refracted as its changes when it passes through different transparent media.
 (a) frequency (b) velocity
 (c) quantity (d) All the previous answers

B) What happens if...?

- 1 The distance between a light source and a surface is doubled. (In terms of light intensity)
 - The light intensity decreases to quarter.
- 2 A light ray travels from air to water.
 - It refracts near the normal.

C) Mention the use of:

- Glass prism: It analyzes the white light into seven spectrum colors.

2 A) Put (✓) or (✗):

- 1 The light rays refract far from the normal when it passes from glass to water. (✓)
- 2 By increasing the thickness of a transparent medium, the quantity of light passing through it increases. (✗)

B) Compare between each of the following:

1

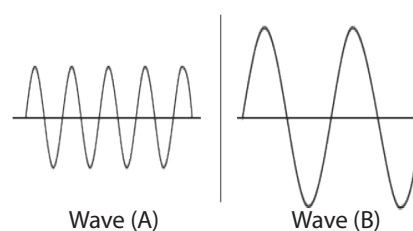
P.O.C	Noise	Musical tones
Frequency	Irregular frequency	Regular frequency

2

P.O.C	Fundamental tones	Harmonic tones
Sound intensity	They have higher intensity than harmonic tones.	They have lower intensity than the fundamental tones.

C) Look at the opposite figure, then answer:

- Which wave has the highest pitch, and which one has the highest intensity?
- Wave (B) has the highest pitch, while wave (A) has the highest intensity.



Model (3)

15
Marks

1 A) Write the scientific term:

- 1 The tones that accompany the fundamental tone, but they are higher in pitch and lower in intensity. **(Harmonic tones)**
- 2 It is the ability of the transparent medium to refract light. **(Optical density)**

B) Give a reason for:

- 1 The absolute refractive index of any transparent medium is always greater than one.
- Because the velocity of light through air is always greater than that through any transparent medium.
- 2 The voice of women is sharper than the voice of men.
- Because the voice of women is high pitched and has higher frequency than men.

C) Calculate the velocity of light through glass, if the velocity of light through air is 3×10^8 m/s and the absolute refractive index of glass is 1.5.

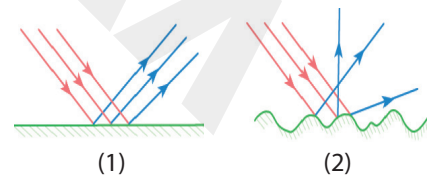
- Velocity of light _(in glass) = $\frac{\text{Velocity of light through air}}{\text{Absolute refractive index of glass}} = \frac{3 \times 10^8}{1.5} = 2 \times 10^8$ m/s

2 A) Choose the correct answer:

- 1 Light is responsible for the formation of inverted images when rain falls.
(a) reflection (b) velocity **(c) refraction** (d) quality
- 2 The resonance box the intensity of sound.
(a) decreases **(b) increases** (c) reduces (d) doesn't change

B) Look at the opposite figure, then answer:

- 1 Identify the type of reflection in each figure.
- Fig. (1) represents regular reflection.
- Fig. (2) represents irregular reflection.
- 2 State the type of surface responsible for each type of reflection.
- Fig. (1) Smooth surface, Fig. (2) rough surface.



C) What is meant by ...?

- The angle of emergence in a prism is 40° .
- This means that the angle between the emergent light ray and the perpendicular to the interface at the point of emergence equals 40° .

Model (4)

15
Marks

1 A) Complete the following sentences:

- 1 A vibrating tuning fork produces **fundamental** tone.
- 2 The **red** color has the longest wavelength, while the **violet** color has the shortest wavelength.

B) What happens when ...?

- 1 The length of the vibrating string decreases. (In terms of sound pitch)
- **The pitch of the produced sound increases.**
- 2 A light ray falls perpendicular to the interface between two different media.
- **The light ray passes without refraction.**

C) Compare between ...:

P.O.C	Transparent medium	Translucent medium
Permission of light	It permits most light to pass through.	It permits only part of light to pass through.

2 A) Correct the underlined words:

- 1 The light rays that falls perpendicular to the interface reflects at 90 degrees. (**zero degree**)
- 2 The light intensity is inversely proportional to half of the distance between the light source and the surface. (**square**)

B) What is meant by ...?

- 1 The distance traveled by light in a time of 5 seconds equals 15×10^8 meters.
- **This means that the velocity of light is 3×10^8 m/s.**
- 2 The angle of refraction of a light ray is 50° .
- **This means that the angle between the refracted light ray and the normal at the point of incidence on the interface is 50° .**

C) Savart's wheel rotates with a rate of 300 cycle per minute. A sound of frequency 600 Hz is produced when an elastic plate touches the teeth of one gear. Calculate the number of the teeth of the gear.

$$\text{Time (t)} = 1 \times 60 = 60 \text{ seconds}$$

$$\text{No. of gear teeth (n)} = \frac{\text{Time in seconds (t)} \times \text{Frequency (F)}}{\text{No. of cycles (d)}} = \frac{600 \times 60}{300} = 120 \text{ Teeth}$$

Model (5)

15
Marks

1 A) Put (✓) or (×):

- 1 When a light ray falls on a rough surface, it reflects in one direction. (×)
- 2 The velocity of light increases by increasing the density of medium. (×)

B) Give a reason for:

- 1 The piano sound differs from that of the violin even if they have the same intensity and pitch.
- **Due to the difference in the harmonic tones that associate the fundamental tone of each them.**
- 2 The energy of green photon is larger than the that of yellow photon.
- **Because the frequency of the green photon is more than that of the yellow photon.**

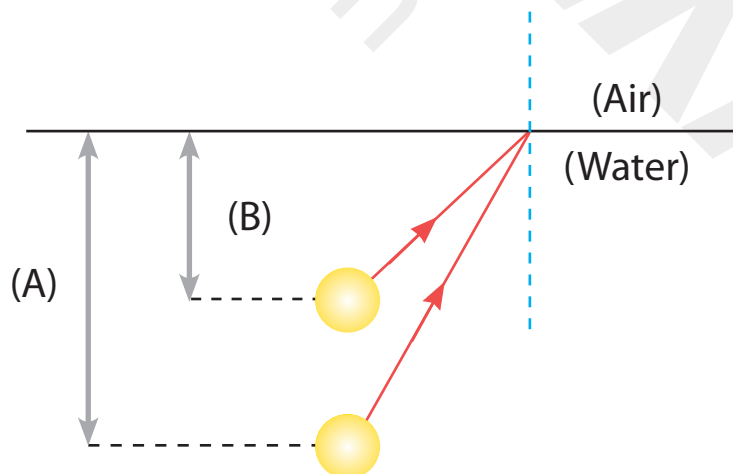
C) Explain how mirage phenomenon occurs.

- **Mirage phenomenon occurs due to the reflection and refraction of light through air layers which differ in the degree of temperature.**

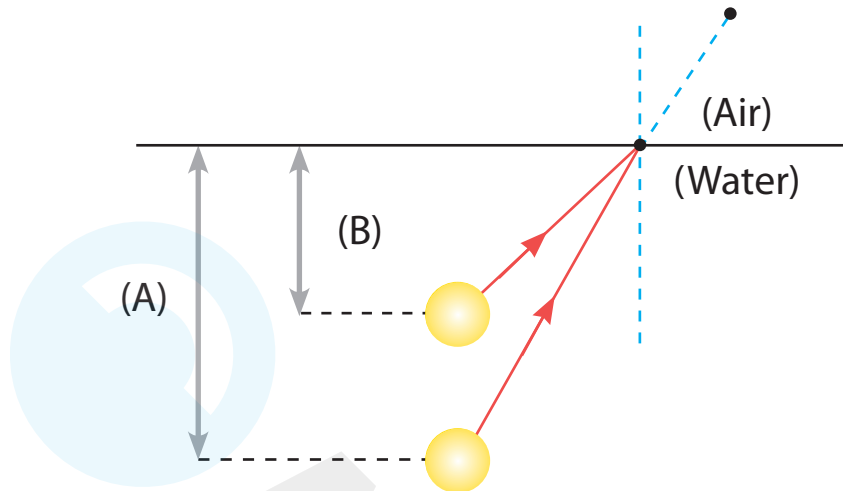
2 A) Complete the following sentences

- 1 The sound of a lion is **harsh**, so it is said that it has a **low**-pitched sound.
- 2 Light travels through **transparent** media in **straight** lines.

B) Look at the following figure, then answer:



- 1 Complete the path of the light rays through which the eye can see the coin inside the water.



- 2 What are positions (A) and (B) called?

- (A): **Real position**

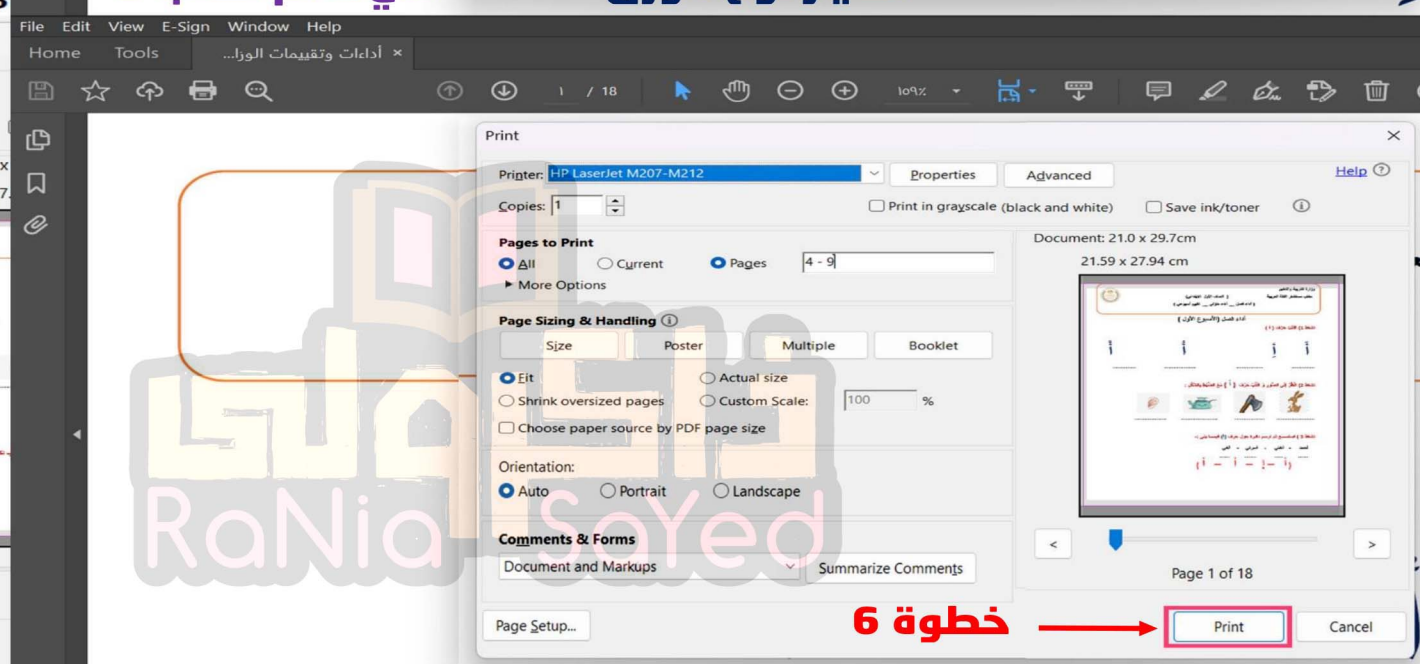
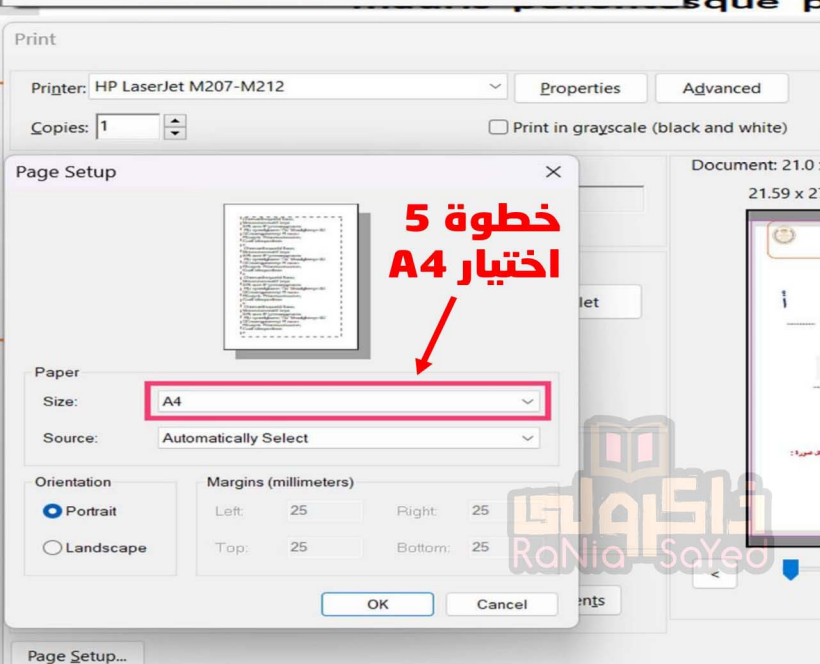
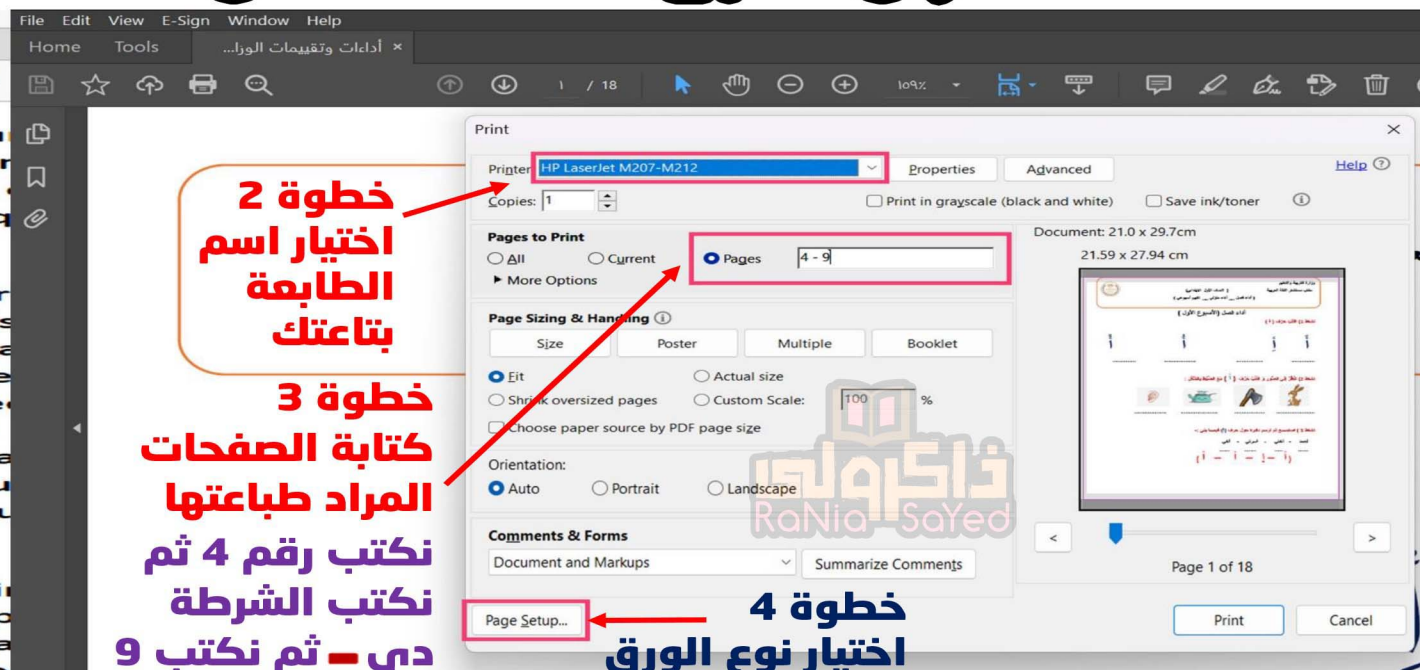
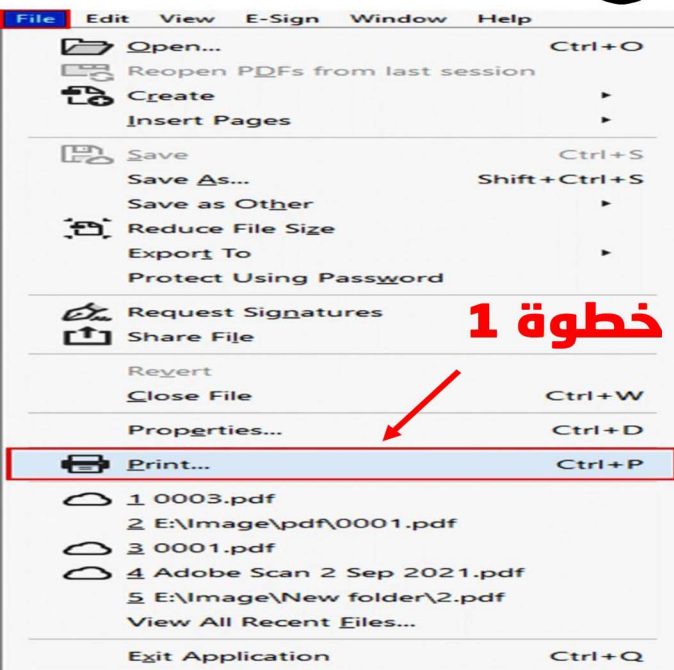
(B): **Apparent position**

C- Mention one use for:

- Ultrasonic waves in the medical field:

- **It is used in breaking down kidney and ureter stones without and surgical interventions.**

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

اختبار شهر مارس



Properties of Sound Waves

Worksheet**6****1. Complete the following statements :**

1. The human ear can differentiate between the sounds through different factors which are sound, sound and sound
2. Sound is produced due to *(Al-Shrouk Zone / Cairo 2022)*
3. Sound waves are waves which travel through air as pulses of and
4. The voice of lion is pitch than that of sparrow.
5. The frequency of the vibrating string is proportional to its length.
6. Musical tone is a sound of frequency and it is produced from and

2. 1. If the frequency of sound produced from Savart's wheel is 1000 Hertz, when the metallic plate touches the teeth of a certain gear. Find the number of teeth of such gear if the wheel makes 250 rotations in one and a half minute.

.....

.....

2. A tuning fork produces a sound wave of frequency 512 Hz, if its wavelength is 65 cm , calculate the velocity of sound through air in metre/sec.

.....

.....

3. What is meant by ... ?

1. Sound pitch. *(Dakahlia 2023)*

.....

.....

2. The wavelength of a sound wave equals 3 cm. *(Omar Al-Farouk Sch. / Sharkia 2019)*

.....

.....

3. Sound velocity.

.....

.....



4. A. Give reasons for :

1. We hear sound from all directions that surround the sound source.

(Al-Montazah Zone / Alex. 2022)

2. The violin's player changes the length of strings during his play.

B. You have three gears in Savart's wheel shown in the table. Answer the following : By rotating them and touching each with a metallic plate.

1. The sharp sound is produced from touching the plate to the gear number

The gear no.	A	B	C
No. of teeth	20	40	60

2. Adham has run the wheel to 540 cycles/min. and the half of the frequency equals 180 Hz. Which gear has Adham touched with the plate ?

Worksheet

7

1. Write the scientific term :

1. The measuring unit of sound intensity. (Gharbia 2023) (.....)
2. The intensity of sound at a point varies inversely with the square of the distance between that point and the sound source. (Menofia 2019) (.....)
3. The characteristic by which the ear can distinguish strong or weak sounds. (.....)
4. The measuring unit of noise intensity. (.....)

2. A. Choose the correct answer :

1. All of the following are factors affecting sound intensity, except the

a. amplitude of vibration. b. medium density.
c. frequency. d. wind direction.

(Dokki Zone / Giza 2019)

2. The intensity of sound in the presence of carbon dioxide as a medium for sound travels is that in the presence of air.

a. equal to b. higher than c. lower than d. half of

3. The intensity of sound when the direction of sound waves propagation is in the opposite direction of wind.

a. decreases b. increases c. doesn't change d. double

Part 1

B. Give reasons for :

1. The intensity of sound increases when the sound source touches a resonance box.

.....

2. The intensity of sound decreases as the distance between the ear and sound source increases.

.....

.....

3. Mention the relationship between each of the following :

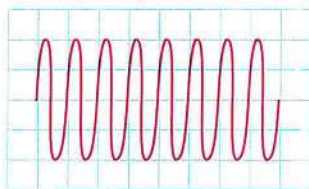
1. The sound intensity and the amplitude of vibration of the sound source.

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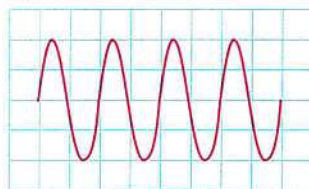
2. The intensity of sound and the density of the medium through which the sound passes.

.....

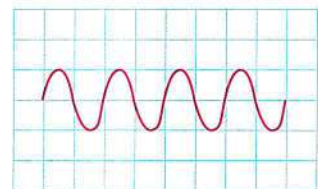
4. Using the following figures, compare from the point of view of sound intensity and pitch between :



Wave (A)



Wave (B)



Wave (C)

1. Sound wave (A) and sound wave (B).

.....

.....

2. Sound wave (B) and sound wave (C).

.....

.....

Worksheet

8

1. A. Put (✓) or (✗) :

1. Ultrasonic waves have frequencies less than 20 Hz.

()

2. Sound of frequency 25000 Hz is audible sound.

()

3. Bats, dogs and dolphins can hear ultrasonic waves.

(Heliopolis Zone / Cairo 2022) ()

B. What is meant by ... ?

1. Sonic waves.

(Giza 2023)

.....

2. Sound quality.

.....



2. You have several resonating sources with different frequencies :

These sources are arranged ascendingly according to their frequencies in the following table :

Resonating source :	1	2	3	4
Its frequency (vibrations/sec.) :	10	50	10000	30000

1. You can hear sound waves produced from vibration of sources number :

[(1 , 2) , (2 , 4) , (1 , 4) , (2 , 3)] (Choose one answer)

2. The waves used in food sterilization is produced from source(s) number :

[(1 , 2) , (2 , 3) , (4 only) , (3 , 4)] (Choose one answer)

3. Does any of these waves travel through free space ? Why ? (Answer)

.....

4. The waves that are produced from the vibration of the vibrating sources are called :

a. Sonic in case of source number (Complete)

b. Ultrasonic in case of source number

c. Infrasonic in case of source number

3. Give reasons for :

1. Dogs can hear all sounds produced by man.

.....
.....

2. The piano sound differs from that of violin sound even if they have the same intensity and pitch.

(El-Minia 2019)

.....
.....

3. The importance of ultrasonic waves.

.....

4. A person stands near an apparatus producing different sounds of different frequencies as follows :

(12 Hz , 15 Hz , 35 Hz , 50 Hz , 1000 Hz , 15000 Hz , 20000 Hz , 25000 Hz).

Which of these sounds will be heard by such person ? Why?

.....
.....

1. What is meant by ... ?

1. Speed of light.

(Al-Agamy Zone / Alex, 2019)

.....

2. Light.

.....

3. Visible light.

(Dokki Zone / Giza 2019)

.....

2. A. Give reasons for :1. The energy of red light photon is less than that of orange light photon. *(Menofia 2019)*

.....
.....

2. Light can travel through free space.

(Cairo 2023)

.....
.....

B. Mention the uses of light.

.....
.....

3. Choose the correct answer :

1. Light waves are waves.

(Qaliubya 2019)

a. mechanical transverse

b. electromagnetic transverse

c. electromagnetic longitudinal

d. mechanical longitudinal

2. The quantum of energy of green light is the quantum of energy of yellow light.

a. greater than

b. equal to

c. less than

d. half

(Ismailia 2022)



3. All of the following are from the characteristics of the red colour in spectrum colours, except

- a. it has the lowest frequency. b. its photon energy is the smallest one.
c. its photon has the highest deviation. d. it has the longest wavelength.

4. Energy of the photon equals

- a. Planck's constant + Frequency. b. Planck's constant ÷ Frequency.
c. Planck's constant × Frequency. d. Planck's constant – Frequency.

5. scientist proved that the energy of light waves is composed of photons.

- a. Isaac Newton b. Kepler
c. Al-Hassan Ibn El-Haitham d. Max Planck

Worksheet 10

1. Compare between : transparent medium and translucent medium :

(Ismailia 2019)

Points of comparison	Transparent medium	Translucent medium
• Definition :
• Examples :

2. Write the scientific term :

1. A medium doesn't allow light rays to penetrate through. (.....)

(Omar Al-Farouk / Sharkia 2019)

2. The light intensity of a surface is inversely proportional to the square of the distance between the surface and the source of light. (.....)

(6th of October / Giza 2019)

3. The quantity of light falling perpendicular to a unit area of a surface in one second.

(Qalyoub Zone / Qalyoubia 2022) (.....)

Part 1

3. Put (✓) or (✗) :

1. The light travels in curved lines through transparent medium. ()
2. By increasing the thickness of the transparent medium, the quantity of light that passes through it increases. ()
3. Carton and human skin are examples of opaque medium. ()

4. Give reasons for :

1. The inability to see the impurities present in black honey.

.....

.....

2. The intensity of light on a surface decreases to its quarter when the distance between the light source and this surface is doubled.

.....

.....

3. The clothes pins can be seen clearly before and after placing them in a transparent plastic bag.

.....

.....

4. Carton is an opaque medium.

.....

.....



Worksheet

11

on Lessons 1 & 2 Unit Two

1. Complete the following :

1. The energy of the photon is proportional to the of light wave.
2. waves are audible sounds.
3. White light consists of a mixture of seven colours which are known as
4. High pitch sounds have relatively large and small (Alex. 2023)
5. By increasing the speed of rotation in Savart's wheel the frequency , and the sound becomes

2. A. Calculate the number of the gear teeth of Savart's wheel, given that the frequency of the sound produced is 100 Hz and the wheel rotates 30 cycles/min.

(6th of October Directorate / Giza 2019)

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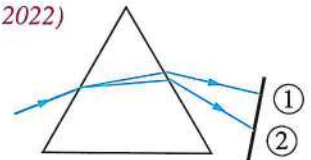
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B. In the opposite figure :

(Al-Shrouk Zone / Cairo 2022)

Which ray represents the red colour and
which ray represents the violet colour ?



.....

.....

3. A. Choose the unsuitable word, then express the rest of the words with something proper.

1. Yellow / Blue / White / Violet. (Deirmwas Official Sch. / El-Menia 2022)

.....

2. Violin / Drill / Piano / Reed pipe.

.....

B. Put (✓) or (✗), then correct what is wrong :

1. The sound velocity through liquids is less than that through gases. ()

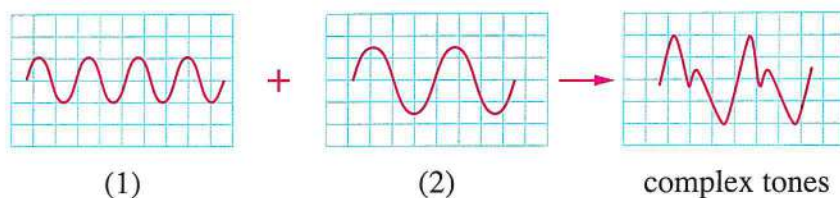
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Part 1

2. Light travels through transparent media in the form of straight lines. ()

3. Sound wave of frequency 15000 Hz is audible sound. ()

- 4.** The following figures shows the formation of complex tones. Which of the two figures (1) , (2) represents the fundamental tone and which one represents the harmonic tone. (give a reason).

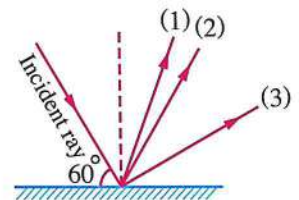


1. A. Write the scientific term :

1. A smooth or rough surface at which the reflection of light takes place. (.....)
2. The angle between the incident ray and the line perpendicular to the reflecting surface at the point of incidence. (.....)

B. From the opposite figure, answer the following :

1. The reflected ray is number
2. The angle of reflection =



2. A. What is meant by ... ?

1. Light reflection.

.....

2. Angle of reflection.

(Cairo 2019)

.....

B. Study the following figures, then answer the questions :

1. Find the value of the angle of incidence and the angle of reflection in each of the following cases :

(Ismailia 2022)

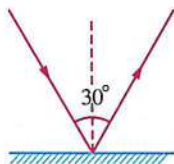


Fig. (1)

.....
.....

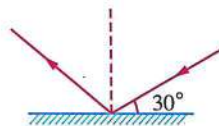


Fig. (2)

.....
.....

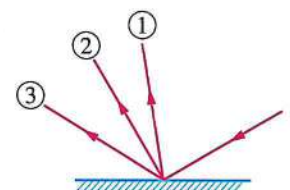


Fig. (3)

.....
.....

2. Which of the following reflected rays represents the reflected ray in the right direction and why ?

.....
.....



3. A. State the two laws of light reflection :

(Borg Al-Arab Zone / Alex. 2022)

* First law :

* Second law :

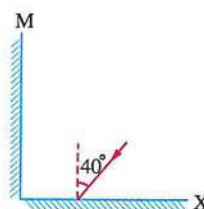
B. Choose the correct answer :

1. If the angle between the incident ray and the reflecting surface is 60° , then the angle between the incident and the reflected rays will be

- a. 30° b. 60° c. 15° d. 120°

2. In the opposite figure, when a ray of light falls on the mirror (X) by an angle 40° , the reflected ray will fall on the surface of the mirror (M) by angle of incidence equals

- a. 30° b. 60° c. 40° d. 50°



4. What happens when ... ?

1. A light ray falls perpendicular on a reflecting surface. Why ? (New Cairo Zone / Giza 2019)

.....

2. Incidence of light rays on a rough surface. (Ismail-El-Habrouk Sch. / Behira 2019)

.....

Worksheet 13

1. A. Give reasons for :

1. The light refracts when it travels from a transparent medium to another of different optical density.

.....

2. The absolute refractive index of any transparent medium is larger than one.

(Al-Mostakbal Modern Sch. / Giza 2019)

.....



3. A coin in a glass of water appears in a position higher than its real position.

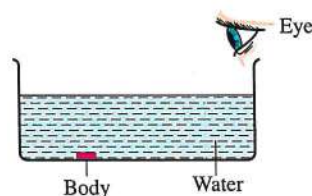
.....

B. Complete the following :

- When a light ray travels from a transparent medium of higher optical density to another of lower optical density, the angle of is more than the angle of
- Light is the change of light path when it travels from a transparent medium to another one of different

(Qena 2019)

2. A. Show by drawing the path of the ray by which the eye can see the body.



B. Choose the correct answer :

A hunter standing on the shore of the sea, he wants to catch fish under water surface, so he should direct the arrow

- | | |
|--------------------------------|---------------------------------|
| a. to the body of the fish. | b. above the body of the fish. |
| c. below the body of the fish. | d. beside the body of the fish. |

3. What happens when ... ?

- A light ray falls perpendicular to the interface between two transparent media of different optical densities.

(El-Agamy Zone / Alex. 2019)

.....

- You look at a pencil partially immersed in a cup of water. Why ?

(Dokki Zone / Giza 2019)

.....

4. A. Write the scientific term :

- A natural phenomenon that takes place on desert roads at noon in summer times.

(Al-Mostakbal Sch. / Giza 2019) (.....)

Part 1

2. The ability of the transparent medium to refract the light.

(Helwan Zone / Cairo 2022) (.....)

3. The angle between the emergent light ray and the normal at the point of emergence on the interface.

(El Sahel Zone / Cairo 2022) (.....)

B. What is meant by ... ?

1. The absolute refractive index of water is 1.3

(East Zagazig Zone / Sharkia 2019)

.....
.....

2. The angle of refraction.

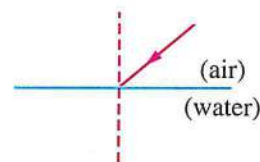
(Dakahlia 2019)

.....
.....

C. Complete the opposite figure, then answer the following :

1. The light ray refracts the normal.

2. The angle of is greater than the angle of





General Exercise

of the School Book

on Unit Two

1. Write the scientific term :

1. Sound waves of frequencies less than 20 Hz. (.....)
2. A medium does not allow light rays to penetrate through. (.....)
3. Changing the path of light when travel from a transparent medium to another transparent medium of different optical density. (.....)

2. Choose the correct answer, with the scientific explanation :

1. Sound of frequency 200 Hz is than sound of frequency 100 Hz.

a. sharper b. stronger c. harsher d. weaker

.....
.....

2. When the distance between the source of light and the surface as a wall decreases, the light intensity on the surface

a. decrease. b. increases. c. doubled. d. remains constant.

.....
.....

3. Write down the mathematical relation that joins between each of the following :

1. The photon frequency and its energy.

.....

2. The sound frequency (F), the number of teeth of the gear in Savart's wheel (n).

.....

4. What are the results due to each of the following ... ?

1. Incidence of light rays on a rough surface.

.....
.....

2. Incidence of a white light ray on one face of a triangular glass prism.

.....
.....

Part 1

5. What is the scientific basis on which the following depends ?

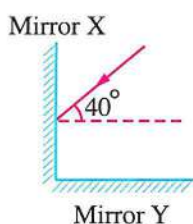
The strings of a musical lute are fixed on a hallow wooden box.

.....

.....

6. Complete the path of rays in each of the following figures according to what is written below each :

A.

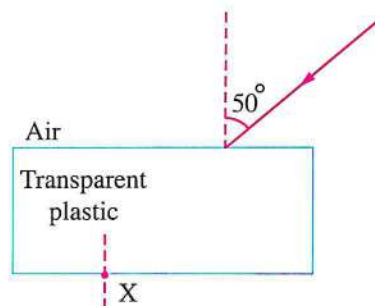


Determination of the angle of reflection of the ray on mirror (Y).

.....

.....

B.



Calculating the angle of emergence from point (X) given that the optical density of air is less.

.....

.....



Model Exams

on Unit Two

Model Exam

1

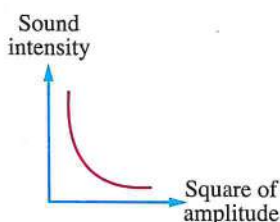
56

Answer the following questions :

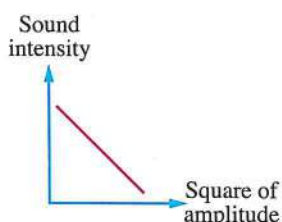
Question 1 14 marks

A Choose the correct answer :

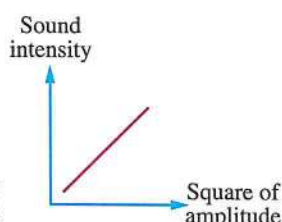
- The substance that a sound wave travel through is called the
a. medium. b. vacuum. c. rarefaction. d. mediary.
- The angle of incidence of light is its angle of reflection.
a. larger than b. smaller than c. equal to d. double to
- The human skin is considered as a/an medium.
a. transparent b. semi-transparent c. opaque d. translucent
- The figure represents the relation between the intensity of sound and the square of amplitude of vibration of a vibrating body.



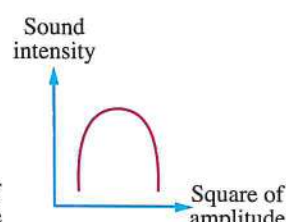
a.



b.



c.



d.

B Put (✓) or (✗) :

- When light ray travels from air to water it reflects. ()
- The fish is seen higher than its real position in the fish tank. ()
(Qeft Educational Adminstration / Qena 2019)
- Bats, dogs and dolphins can hear ultrasonic waves. ()
(Port Said Educational Zone 2019)
- Wood doesn't allow the passage of light through it. ()
(Belkas Administration / Dakahlia 2019)

Part 1

C Give a reason for :

The pencil which is partially immersed in water, appears as being broken.

.....

.....

Question 2 14 marks

A Write the scientific term :

1. A tone of regular frequency that is produced from reed pipe. (.....)
2. The ability of the medium to refract light rays. (.....)

(El-Gomrok Zone / Alex. 2019)

3. Seven colours are produced as a result of splitting of the white light. (.....)
4. A property by which the human ear can distinguish between strong and weak sounds.

(6th of October Directorate / Giza 2019) (.....)

B From the opposite figure :

1. What is the type of slide that placed over the image ?
.....
2. Explain why, we can't see the part present below (X) clearly ?
.....



C What is meant by ... ?

The angle of reflection of light ray = 30°

.....

Question 3 14 marks

A Correct the underlined words in the following statements :

1. The produced tone from a tuning fork is called complicated tone. (.....)

(Patriarchal College / Cairo 2019)

2. Sonic waves are used in sterilization of milk. (.....)

(6th of October / Giza 2019)

3. White light travels in curved lines. (.....)

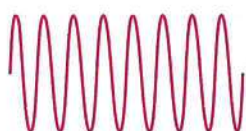
(6th of October Directorate / Giza 2019)

4. The absolute refractive index is equal to one. (.....)

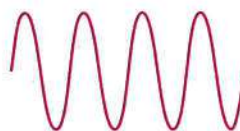
(El-Gomrok Zone / Alex. 2019)



- B** Compare between the two waves (A) , (B) in terms of pitch (Give a reason).



Wave (A)



Wave (B)

The sound pitch of wave is higher than the sound pitch of wave

Because :

- C** What is the importance of Savart's wheel ?

(El-Agamy Zone / Alex. 2019)

.....

Question 4 14 marks

- A** Cross the odd word out, then write the scientific term of the rest words :

1. Yellow / Blue / White / Violet / Red. (.....) (.....)
2. Glass / Ceramic / Air / Water. (.....) (.....)
3. Milk / Cotton / Air / Human skin. (.....) (.....)
4. Sound wave its (F) = 100 Hz / Sound wave its (F) = 1KHz / Sound wave its (F) = 40 Hz / Sound wave its (F) = 10 Hz. (.....) (.....)

(Ismail El-Habrouk Formal Sch. / El-Behira 2019)

- B** What does these relations indicate ?

1. $\frac{\text{Velocity of wave propagation}}{\text{Wave frequency}}$ (Patriarchal College / Cairo 2019) (.....)
2. Planck's constant \times Photon frequency. (Patriarchal College / Cairo 2019) (.....)
3. Sound intensity (I) $\propto \frac{1}{\text{Square of the distance between the ear and the sound source (d}^2\text{)}}$ (.....)
4. $\frac{\text{Velocity of light through air}}{\text{Velocity of light through glass}}$ (.....)

- C** Savart's wheel rotates with a rate of 300 cycles per minute, a sound of frequency 600 Hz is produced when an elastic plate touches the teeth of one gear, calculate the number of teeth of the gear.

(Al-Shaheed Sheriff Talat Sch. / El-Sharkia 2022)

.....

Answer the following questions :

Question 1 14 marks

A Complete the following statements :

1. The light reflection is classified into two types which are and
2. Sounds of different musical instruments can be differentiated from each other by
3. When you look at a coin in a glass of water, its position appears to be lower than the position.
4. The light intensity is the amount of light

B Mention an example for :

1. Mechanical longitudinal wave. (.....)
2. Regular reflection. (El-Gomrok Zone / Alex. 2019) (.....)
3. Transparent medium. (El-Agamy Zone / Alex. 2019) (.....)
4. An opaque medium. (.....)

C Mention two factors only affecting the sound intensity.

(Cairo 2023)

.....

.....

.....

.....

Question 2 14 marks

A Choose from column (B) what suits it in column (A) :

(Borg Al-Arab Zone / Alex. 2022)

(A)	(B)
1. The sound pitch	a. is the characteristic, by which the ear can differentiate between the sounds as strong or weak.
2. The quality of sound	b. is the property, by which the ear can distinguish between sharp and rough sounds.
3. The sound intensity	c. is the number of the complete vibrations in one second.
	d. is the characteristic, by which the ear can distinguish between sounds from different sources even if they are equal in intensity and pitch.

1.

2.

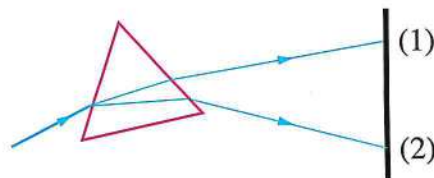
3.



B In the opposite figure :

1. Which ray represents the red colour and which ray represents the violet colour ?

(Al-Shrouk Zone / Cairo 2022)



2. Which one has a greater energy, the photon of red light or the photon of violet light ?

C Compare between regular reflection and irregular reflection. (definition only)

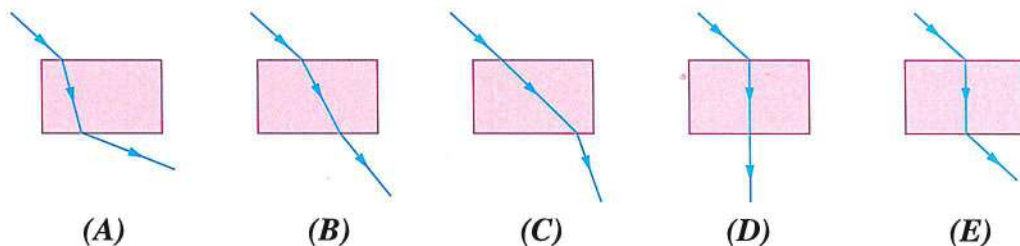
(El Sayeda Khadija Sch. / Cairo 2022)

Question 3 14 marks

A Put (✓) or (✗) :

- As the length of the vibrating string decreases, the frequency of the produced sound increases. ()
- Sound wave of frequency 25000 Hz is audible sound. ()
- Light intensity of a surface decreases as the distance between the surface and the light source increases. ()
- The light ray refracts near to the normal when it travels from air to glass. ()

B Choose from the following figures the one that expresses correctly the refraction of light in a rectangular glass block and mention the reason.



C Calculate the absolute refractive index of water, knowing that the velocity of light through water is 2.25×10^8 m/s and the velocity of light through air is 3×10^8 m/s.

Part 1

Question 4 14 marks

A Study the given table and answer the following questions :

1. Complete the following :

- (1) The frequency of point (X) is Hz.
- (2) The frequency of point (y) is Hz.

Area	Waves
3 y	Ultrasonic waves
2 X	Sonic waves
1 1	Infrasonic waves

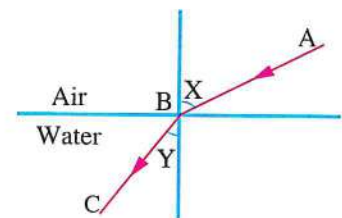
2. Choose :

- (1) Frequency is in area (1).
 a. 15 Hz b. 22 Hz c. 2000 Hz d. 25000 Hz
- (2) Frequency is in area (2).
 a. 15 Hz b. 22 Hz c. 25000 Hz d. 30000 Hz
- (3) Frequency is in area (3).
 a. 15 Hz b. 22 Hz c. 2000 Hz d. 25000 Hz
- (4) Dogs and dolphins can hear waves.
 a. infrasonic b. sonic c. ultrasonic d. (b) and (c)
- (5) Bats can hear waves.
 a. infrasonic b. sonic c. ultrasonic d. (b) and (c)
- (6) Medical diagnosis instruments are made by using waves in area.
 a. first b. second c. third d. (a) and (b)

B From the opposite figure, complete the following statements :

(Gharbia 2022)

1. The ray (AB) represents
2. The ray (BC) represents
3. Angle (X) is
4. Angle (Y) is



C Give a reason for :

Occurrence of mirage phenomenon in desert regions at noon.

(Ismailia 2019)

Reproduction in Plants

Worksheet

14

1. Study the opposite figure, then answer the following :

1. The figure represents a flower.

2. Label the figure.

①

②

③

④

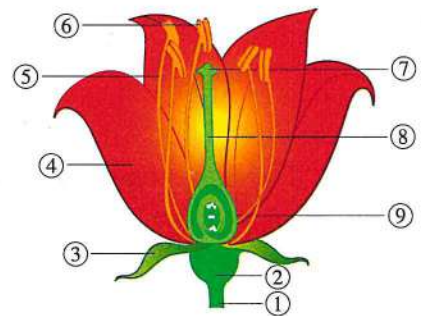
⑤

⑥

⑦

⑧

⑨



3. The organ which consists of parts (7) , (8) and (9) is called , while the organ which consists of parts (5) and (6) is called

2. A. Give reasons for :

1. Palm flowers are unisexual.

(Heliopolis Edu. Zone / Cairo 2022)

.....

2. Petals of corolla are colourful and scented.

(Heliopolis Modern Lang. Sch. / Cairo 2022)

.....

B. Mention the function of :

1. Sepals of calyx :

(Al-Shrouk Edu. Zone / Cairo 2022)

2. Carpel :

(Ismail El-Habrouk Sch. / Behira 2019)

3. A. Write the scientific term :

1. The female reproductive organ of the flower.

(.....)

2. The innermost whorl of a male flower.

(.....)

3. Minute cells formed inside the flower's anther.

(.....)

B. What is meant by hermaphrodite flower ?

.....

Part 1

4. A. Choose the correct answer :

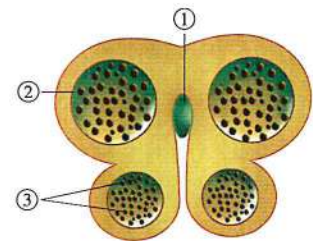
- The male flower consists of whorls.
a. 2 b. 3 c. 4 d. 5
- The symbol of female flower is
a. ♀ b. ♂ c. ♀ d. ⊕
- The ovary of a flower contains
a. pollen grains. b. anthers. c. stigmas. d. ovules.

B. From the opposite figure, answer the following questions :

(Patriarchal College / Cairo 2019)

- The figure represents a cross section in an
- Label the figure.

- ①
- ②
- ③



Worksheet 15

1. A. Complete the following :

- in plants takes place in two successive processes which are pollination then
- fruit has a single seed, while fruit has many seeds.
- Artificial pollination is carried out by such as in

B. Choose the correct answer :

- Flowers which produce light and dry pollen grains are pollinated by
a. man. b. wind. c. water. d. insects.
- After fertilization, the ovary develops and becomes the
a. fruit. b. seed. c. flower. d. embryo.

(Helwan Edu. Zone / Cairo 2022)

2. A. What is meant by ... ?

- Fertilization in plants.

(Fayoum 2019)

.....
.....

- Reproduction process.

.....
.....



B. What happens when ... ?

1. A pollen grain falls on a flower's stigma.

(Qalyoub Edu. Zone / Qalyoubia 2022)

2. Sepals of insect pollinated flowers are not coloured and have no scent.

3. Pollen grains become mature (related to the anther).

(Sharkia 2023)

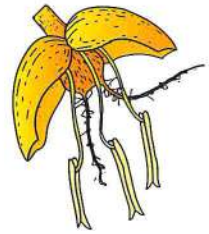
3. A. Give reasons for :

1. Pollen grains of wind pollinated flowers are produced in a huge number.

2. Pollen grains of insects pollinated flowers are sticky or with coarse surfaces.

B. From the opposite figure :

Mention the way by which the pollination process takes place.
Giving a reason.



4. A. Compare between :

Auto pollination and mixed pollination.

(Baverly Hills Sch. / Giza 2019)

Auto pollination	Mixed pollination
.....
.....
.....

B. Examine the opposite figure, then answer the following :

Write the names of the parts numbered from ① to ⑦.

①

②

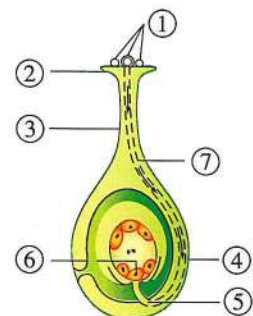
③

④

⑤

⑥

⑦



1. A. Complete the following :

1. reproduction is a kind of asexual reproduction which may be or
2. may be a root as sweet potatoes or a stem as
3. Tissue culture is

B. Choose the correct answer :

1. is a way from the ways of the natural vegetative reproduction.
 - a. Cutting
 - b. Tubers
 - c. Grafting
 - d. Tissue culture
2. Reproduction by grafting can be used between all of the following plants except
 - a. orange and naring.
 - b. apples and pears.
 - c. mango and apples.
 - d. peaches and apricots.

2. The opposite figure represents a kind of reproduction :

1. Label the figure.

①

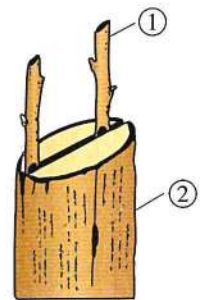
②

2. Mention its kind.

.....

3. Complete :

- a. The part no. ① must be containing more than
- b. The part no. ① is into a in the part no. ②.



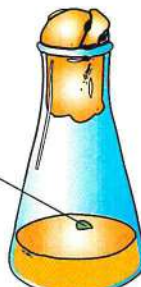
3. The following figures represent steps of tissue culture of a potato stem.

Complete the missing parts under each figure.



The tissue is separated from the part of the

(a)



The tissue is placed in a medium containing and

(b)



The new plant starts to grow till certain size

(c)



The plant is then to the to grow normally

(d)



4. A. What happens when ... ?

Tie a part of a peach (as scion) with a part of an apricot (as stock).

(Helwan Edu. Zone / Cairo 2022)

.....

.....

B. Mention four ways of natural vegetative reproduction :

-
-
-
-

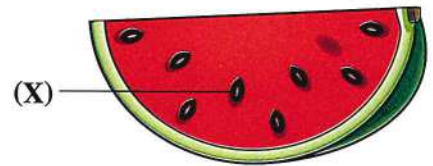
C. The opposite figure shows a section of the fruit of the watermelon plant :

1. What does the letter (X) indicate and what is its origin ?

.....

2. What is the importance of the parts indicated by the letter (X) ?

.....



April Tests

Model 1

Total mark
10

Question 1 5 marks

A Choose the correct answer :

1. If the distance between a surface and light source decreases to its half, the light intensity of the surface
a. decreases to its one fourth. b. decreases to its half.
c. increases twice. d. increases four times.
2. The floral whorl, which is absent (not found) in the female flower is the
a. calyx. b. corolla. c. androecium. d. gynoecium.
3. If the frequency of red colour is 4×10^{12} Hz, the frequency of violet colour is $\times 10^{12}$ Hz.
a. 1.5 b. 3.5
c. 4 d. 7.5
4. If the angle between a reflected light ray and a reflecting surface is 30° , so the angle of reflection will be equal to
a. 15° b. 30°
c. 60° d. 90°

B What is meant by ... ?

The velocity of light is 3×10^8 m/sec.

.....

.....

.....

Part 1

Question 2 5 marks

A Put (✓) or (✗):

1. Auto (Self) pollination occurs in barely plant. ()
2. Reflection of light from rough surfaces is called regular reflection. ()
3. Vegetative reproduction is a kind of sexual reproduction. ()
4. When light ray travels from air to water, the angle of incidence is greater than the angle of refraction. ()

B Give a reason for the following :

The stigmas of air pollinated flowers are feathery like and sticky.

.....

.....

.....

Model 2

Total mark

10

Question 1 5 marks

A Choose from column (B) what suits it in column (A).

(A)	(B)
1. Androecium	a. is the change of the path of light ray when it moves between two media with different optical densities.
2. Light reflection	b. is the male organ in a flower.
3. Gynoecium	c. is the change in the direction of light ray in the same medium, when it falls on a reflecting surface.
4. Light refraction	d. protects the inner parts of a flower.
	e. is the female organ in a flower.

1. 2. 3. 4.



B What happens if ... ?

A compact disc (CD) with shiny side is put to face sunlight.

.....

.....

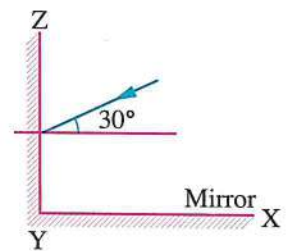
.....

Question 2 5 marks

A Write the scientific term of each of the following :

1. A physical quantity equals Plank's constant is multiplied by frequency. (.....)
2. A group of flowers found on the same axle. (.....)
3. The position, at which the submerged object in water is seen slightly above its real position. (.....)
4. The reproduction of some plants by parts of the roots, stems or leaves. (.....)

B Complete the following figure after redrawing it in your answer sheet, then write the name of each ray :



حمل الآن

مجاناً وحصرياً

المراجعة رقم (3)

اختبار شهر مارس





Unit two

Lesson (1)

Properties of sound waves

Sound

It is an external stimulus that affects the ear causing the sense of hearing.

Nature of sound waves

Sound waves produced from vibration of bodies and it stops when the vibrating bodies stop their vibration.

Sound is mechanical wave so it need a medium (as air) to propagate.

Sound is longitudinal wave as it consists of compressions and rarefactions.

Sound waves propagate through media as spheres whose centers are the source of sound.





Types of sound waves

1- Pleasant to our ears:

They are tones that have uniform frequency as (mechanical tones)

2- Source of disturbance

and noise: They are tones that have non uniform frequency as (Drills – Loud speakers – Horns of cars).

3- Source of fear:

As (Sound of strong wind and thunder)

Sound velocity

It is the distance which covered by the sound wave in one second

$$V = F \times \lambda$$

Note!

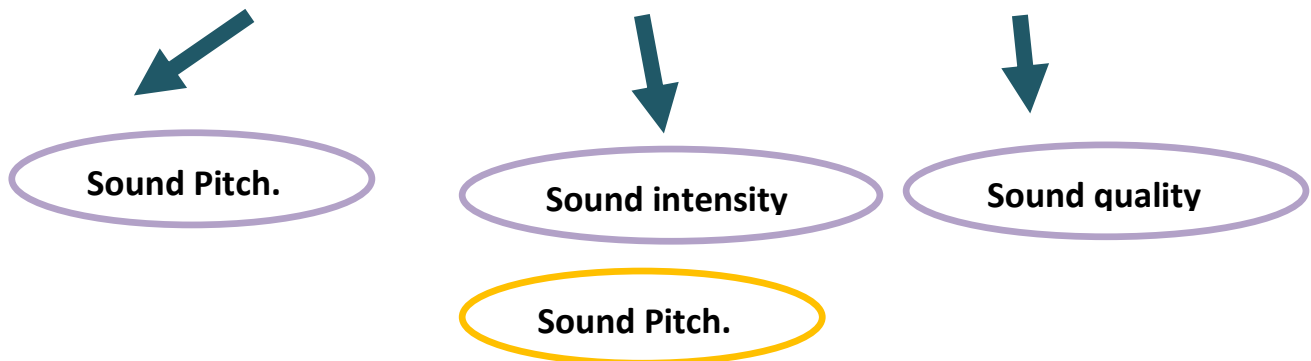
- Velocity of sound through solids is larger than liquids
- Sound velocity in liquids is higher than gases.
- Sound velocity through air is 340 m/sec





Properties of sound waves

The ear can differentiate between the sounds that reach it through three factors



It is the property by which the ear can distinguish between rough and sharp voices.

High pitched	Low pitched
Sharp (soft)	Rough (harsh)
As voice of women, sparrows.	As voice of men, lion.

Note!

- As the sharpness of voice increase the level of voice (pitch) become higher.
- As the frequency increases, the sound pitch increases.





Determination the pitch of a tone by using Savart's wheel:

$$F = \frac{\text{Number of cycles (d) x number of gear's teeth (n)}}{\text{Time (seconds)}}$$

Sound intensity

It is the property by which the ear can distinguish between strong or weak sounds.

Unit: (watt/m²)

Note!

- Sound intensity at certain point is measured by quantity of sound energy falling perpendicular in one second on a unit area at that point.
- If the sound energy is high, it gives strong sound and if the energy is low it give weak sound.
- The sound intensity changes from one person to another according to some factors.
- The level of sound intensity is measured by a unit known as (Decible scale).

Factors affecting the sound intensity:

1. The distance between the ear and the sound source.
2. The amplitude of vibration of sound source.
3. The area of the vibrating surface.
4. The density of the medium through which the sound wave propagates.
5. The direction of the wind.





1- The distance between the ear and the sound source.

The intensity of the sound (I) at a point is inversely proportional to the square of the distance (d^2) between the point and the sound source.

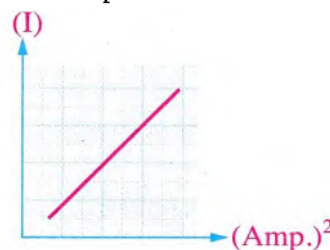
-This is called "The inverse square law of sound.

$$I \propto \frac{1}{d^2}$$

2- The amplitude of vibration of sound source:

Sound intensity is directly proportional to square of the amplitude.

$$I \propto \text{amp}^2$$



3- The area of vibrating surface:

- Sound intensity increase when the surface area of the vibrating body increases. $I \propto \text{area}$
- So it is prefer to put a vibrating object touches a resonance box as the violin or guitar to increase the surface area and increase sound intensity.

4- Medium density:

Sound intensity is directly proportional to the density of the medium in which sound travels. $I \propto \text{density of medium}$

- So sound intensity in CO_2 is higher than air

5- Wind direction:

The intensity of sound increases when the direction of wave propagation is in the same direction of wind and vice versa.





Real life application: **(Ear plugs)**

Ear plugs made of silicon, take the shape of the external ear canal sold in pharmacies to avoid the hazards of noise in loud places.

Sound type (quality)

It is the property by which the ear can distinguish between different sounds according to the nature of sound even if they are equal intensity and pitch.

Examples

- 1) **Tuning fork**: It produce pure and simple tone known as **Fundamental tone**
- 2) **Violin & piano**: They produce **complicated waves** although they are equal in pitch and intensity.

-The complicated tones composed of **fundamental tones** associated by **Harmonic tones** that are high in pitch and low in intensity.

- The harmonic tones differ according to the nature of sound source.

Harmonic tones:

They are tones accompany the fundamental tones and they are low in intensity and high in pitch and they differ from one source to another .





Comparing sound waves according to frequency:

Audible sounds	Non-audible sounds	
<p>Sonic waves</p> <p>They are sound waves of frequency Range from (20 Hz) to (20 K Hz)</p> <p>The brain translate them into sound</p> <p>Produced by sonar</p>	<p>Ultrasonic waves</p> <p>They are sound waves of frequencies higher than (20 K Hz)</p> <p>As the waves that preceding rain falls</p>	<p>Infrasonic waves</p> <p>They are sound waves of frequencies less than 20 Hz As the storms that devices or some animals As dolphin and bats</p>

Note:

- Man produces sound less 20 KHz and dogs hear sounds up to 50 KHz so dogs hear all sounds produced by man
- Dolphin produce sounds up to 120 KHz but man can hear sound to 20 KHz only so we cannot hear dolphins.

Real life applications of ultrasonic waves:

1- In medical field:

- 1-Breaking down kidney and ureters stones without any surgical intervention (operations).
- 2-Diagnosis of male prostate gland tumors and its effect on bladder.
- 3-Discovering malignant tumors.

2- In industrial field:

- 1- Sterilization of food, water and milk as it is characterized by its high ability to kill some types of bacteria and stop the action of some viruses.

- 3- **Military field:** Discovering of landmines.





Homework

1) Complete the following statements:-

- 1- Sound waves propagate through the medium as spheres of and
- 2- Sound waves velocity = ×
- 3- Sharp tones have frequencies, while rough tones have frequencies.
- 4- The sound pitch depends on the of the
- 5- Savart's wheel is used to determine the of unknown sound tone.
- 6- In Savart's wheel, frequency = $\frac{\text{No.of.rotations} \times \dots\dots\dots}{\dots\dots\dots}$
- 7- The measuring unit of the sound intensity is, while that of noise intensity is
- 8- The intensity of sound at a certain point is measured by the quantity of sound energy falling in one second on a at this point.
- 9- When the distance between the sound source and the ear two times, the sound intensity decreases times.
- 10- When the amplitude of sound wave vibration is doubled, the intensity of sound four times.
- 11- The fundamental tone is less in and higher in than the harmonic tones.
- 12- The human ear can realize the sonic waves which its frequency ranging from to Hz.
- 13- Some animals such as, and can hear ultrasonic waves.
- 14- The measuring unit of the wave length is or

2) Choose the correct answer:-

- 1- Before using the modern technology in communication, people in desert were putting their ears on the ground to hear the sound of horses of their enemies from very far places because
 - a- Sense of hearing is stronger than sense of vision.
 - b- The velocity of sound through solids (ground) is greater than that through air.
 - c- Sound travels faster than light.
 - d- Sound of horses' feet is very loud.





- 2- All of these sounds are tones of uniform frequency except the sound of
a- Violin b- guitar c- loudspeakers d- piano
- 3- The sound pitch increases by
a- the decrease of frequency. b- the increase of frequency.
c- the increase of amplitude.
d- the increase of the distance between the ear and the sound source.
- 4- The sound becomes rough by decreasing
a- frequency b- amplitude c- harmonic tones d- quality
- 5- The frequency of the sound produced from Savart's wheel depends on
a- the speed of rotation of the gear only.
b- the distance between the gear and you only.
c- the number of gear's teeth only.
d- (a) and (c) are correct.
- 6- The intensity of sound weakens as we go away from its source, because
a) $I \propto \frac{1}{d}$ b) $I \propto d$ c) $I \propto \frac{1}{d^2}$ d) $I \propto d^2$
- 7- All of the following are factors affecting sound intensity except the
a- amplitude of vibration. b- medium density.
c- frequency. d- wind direction.

3) Write down the scientific term:-

- 1- The distance which is covered by the sound waves in one second. []
- 2- A tone of irregular frequency that is produced from loudspeakers. []
- 3- The measuring unit of the sound intensity. []
- 4- The characteristic by which the human ear can distinguish between sounds from different sources even if they are equal in intensity and pitch. []

4) Give reasons for:-

- 1- The explosions occurred on the Sun surface cannot be heard on the Earth.
.....
- 2- The difference in frequency between the note (tone) and noise.
.....





3- The intensity of sound increases when the sound source touches a resonance box.

.....

4- As the λ increases the frequency decreases.

.....

5) Problems:-

1- A sound source produces 2400 cycles in 2 minutes. If its wavelength is 17 meters, find the velocity of the sound waves.

.....

.....

.....

2- **Calculate** the number of the gear's teeth of Savart's wheel, given that the frequency of the sound produced is 100 Hz. and the wheel rotates 30 cycles /min

.....

.....

.....

3- Savart's wheel produces a sound of frequency 300 Hz. when a metallic plate touches a gear having 75 teeth. Find the time in minutes taken by the wheel to make 360 rotations.

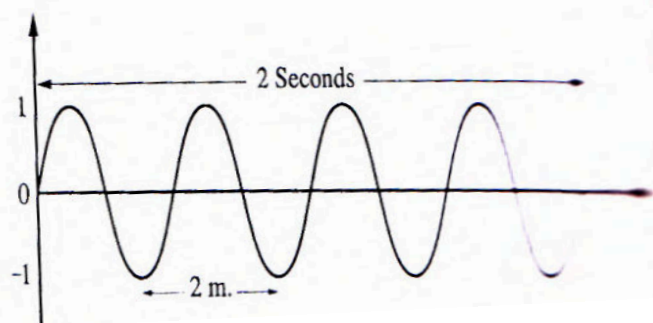
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.....

From the opposite figure find :

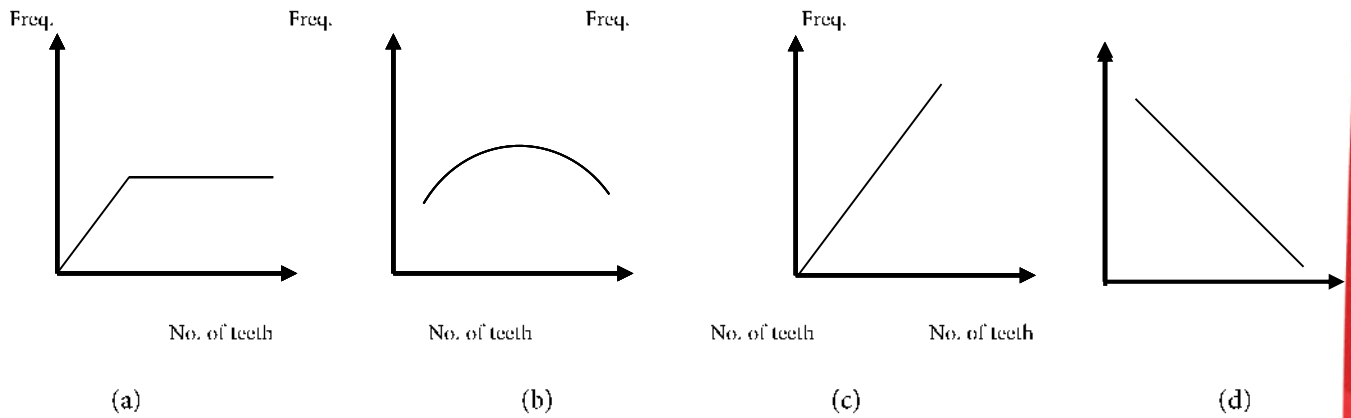
1. Wavelength.
2. Frequency.
3. Amplitude.
4. Wave velocity.



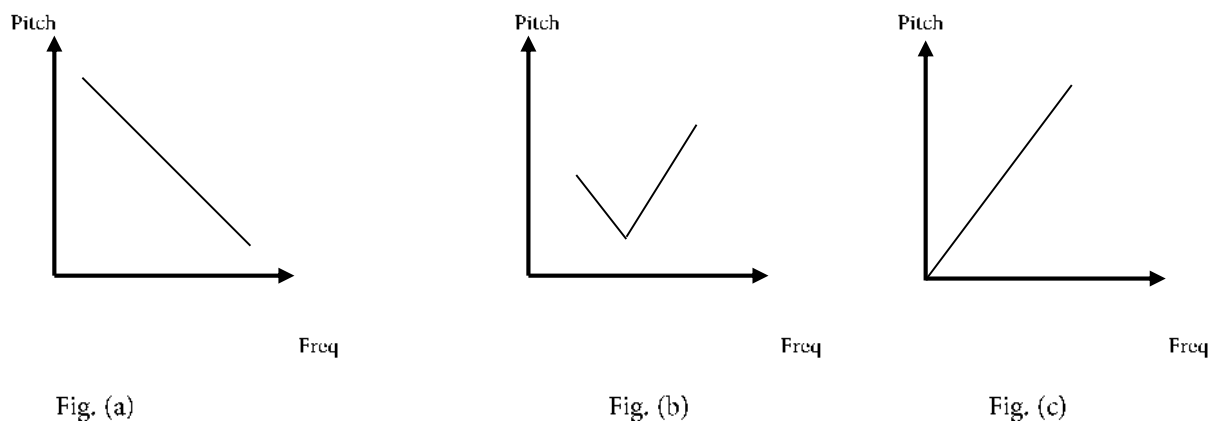


6) Study the following figures, then answer the questions:-

1- In Savart's wheel, which of the following graphs represents the relation between the frequency and the number of gear's teeth at constant speed?

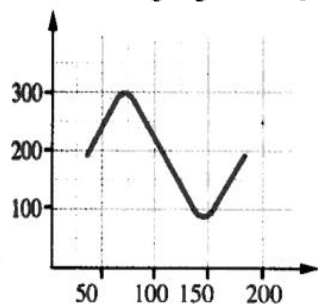


2) Which of the following figures represents the relation between the pitch of a sound and its frequency? Why?

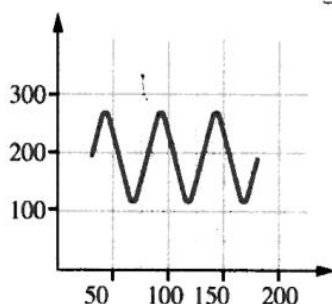




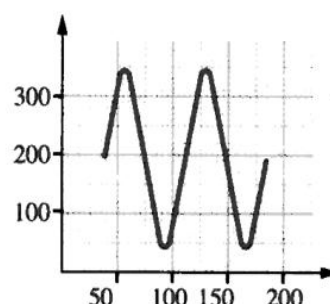
7) The following figures represent three different sound waves:-



(a)



(b)



(c)

- 1- Which figure has the largest amplitude?
- 2- Which figure represents a sharper tone? Why?
- 3- Which figure represents a rough tone? Why?
- 4- Which figure represents sound of higher intensity? Why?

5- Complete:

- a- As the amplitude increases, the sound becomes
- b- As the frequency of sound decreases, the sound becomes of

8- Sound waves of frequency 200 HZ and wave length 1.7 meter in air calculate:

1. Velocity of sound waves in air.

.....

2. Wave length of these waves when they propagate in water with velocity 1500 m/s.

.....

.





Unit two

Lesson (2)

Wave nature of light

Light

It is an external factor affect eye causing the sense of vision.

Nature of light:

- Light waves are electromagnetic transverse waves.
- Speed of light through space is (3×10^8 m/s).

Speed of light

It is the distance covered by light in one second.

- Speed of light through space is (3×10^8 m/s).

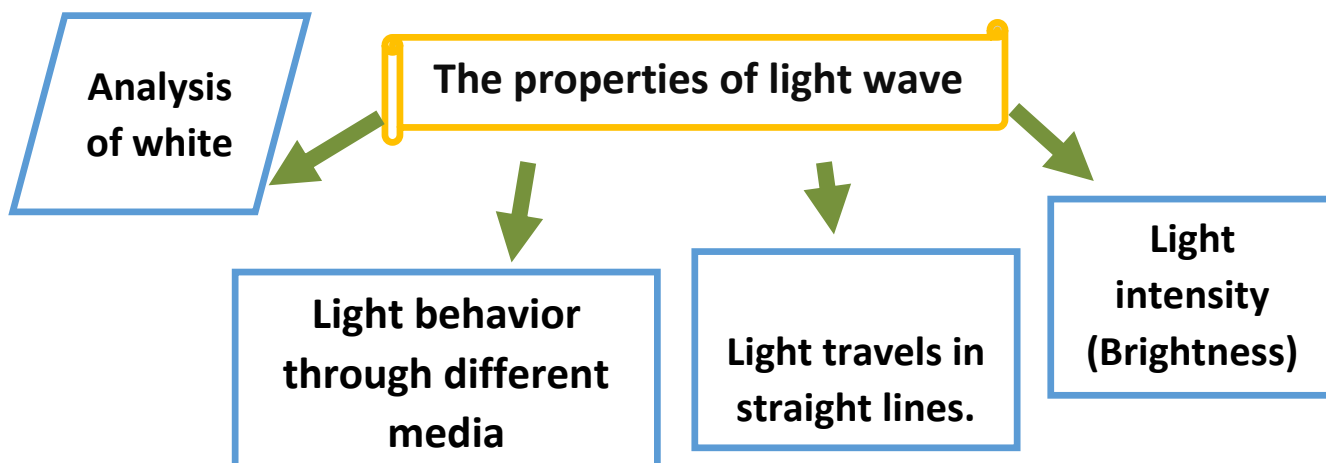
Note!

Visible light

It is one of the waves present in electromagnetic spectrum of wave length ranges between 380 – 700

- nanometers.(1 nanometer = 1×10^{-9})

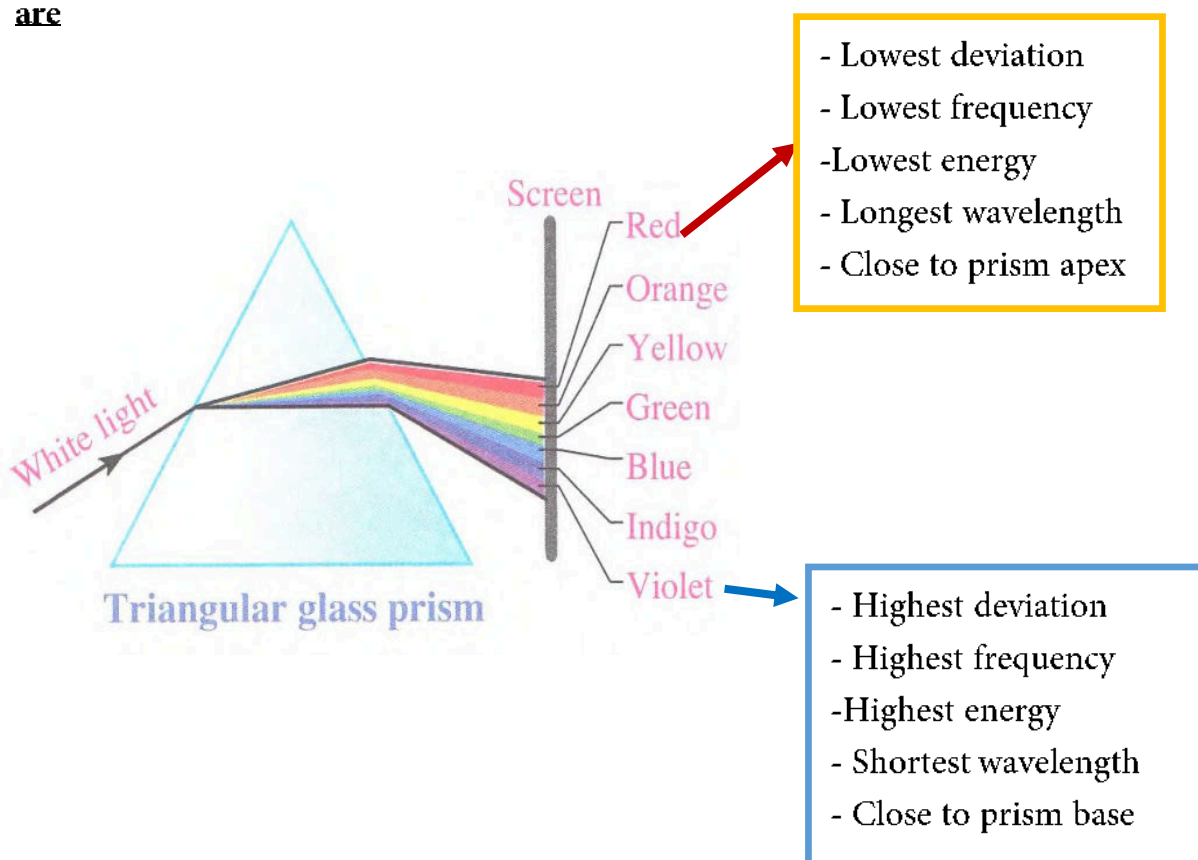




1- Analysis of white light

It is the splitting of white light into seven colors called spectrum colors.

White light can be separated by using a glass prism into seven spectrum colors which are





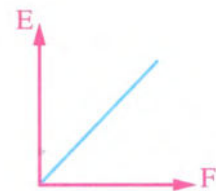
Note!

- The German scientist **Max Planck** proved that the energy of light waves is composed of packets of energy (Quanta) known as photons
- The energy of the photon is directly proportional to the frequency of light wave

Photon energy \propto Photon frequency

Photon energy = Const x photon frequency

This constant value is known as Planck's constant




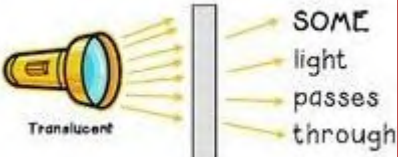

Real life applications for uses of light (spot lights):

- 1- Light is used in home decorations like **spot light** to illuminate artifacts.
- 2- **Ornamented lamps** that bring happiness and joy to the place.
- 3- **Standing lamps** that concentrate light for reading.



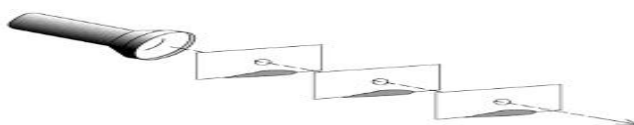
2- Light behavior through different media

Media can be classified according to their ability to allow light to pass into

Transparent materials	Translucent materials (Semi transparent)	Opaque materials
It is the medium which permits Most light to pass.	It is the medium that permits a part of light only to pass	It is the medium that does not permit light to pass
AS: air, clear glass, pure water	As: Flint glass, tissue paper	AS: milk, cartoon, black honey
 <p>Transparent</p>	 <p>Translucent</p>	 <p>Opaque</p>

3- Light travels in straight lines.

Light travels in straight lines with controlling its thickness.



Note!

-As the thickness of the transparent medium increases, the quantity of light that passes through it decreases





4- Light intensity (Brightness)

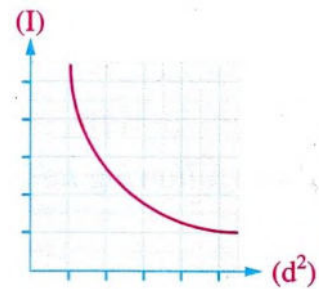
It is the amount of light incident perpendicular to a unit area of a surface in one second.

- Light intensity of a source decrease as the distance between the surface and the light source increase.

- **The inverse square law of light:**

The light intensity of a surface is inversely proportional to the square of the distance between the surface and the light source.

$$I \propto \frac{1}{d^2}$$





Homework

1) Complete the following statements:-

- 1- Light is waves that travel through free space with velocity m/sec.
- 2- Visible light is one of the components of electromagnetic spectrum of wavelength ranges between to nanometers.
- 3- The distance covered by light in one second is called
- 4- White light is a mixture of colors known as
- 5- The glass prism is used to analyze the light into colors.
- 6- is the nearest color to the prism apex, while is the nearest color to the prism base.
- 7- The color has highest frequency and shortest wavelength, while the color has the lowest frequency and longest wavelength.
- 8- The scientist proved that the energy of light waves is composed of energy quanta known as
- 9- The energy of the photon is proportional to the of light wave.
- 10- Energy of photon = constant \times
- 11- By increasing the of the transparent medium, the quantity of light that passes through it
- 12- is the quantity of light falling perpendicular to a of a surface in one second.





13- Light intensity of a surface as the distance between the surface and the light source increases.

14-.....and are transparent media

2) Choose the correct answer:-

1- color has the lowest deviation.

- a- Violet b- Green c- Red d- Yellow

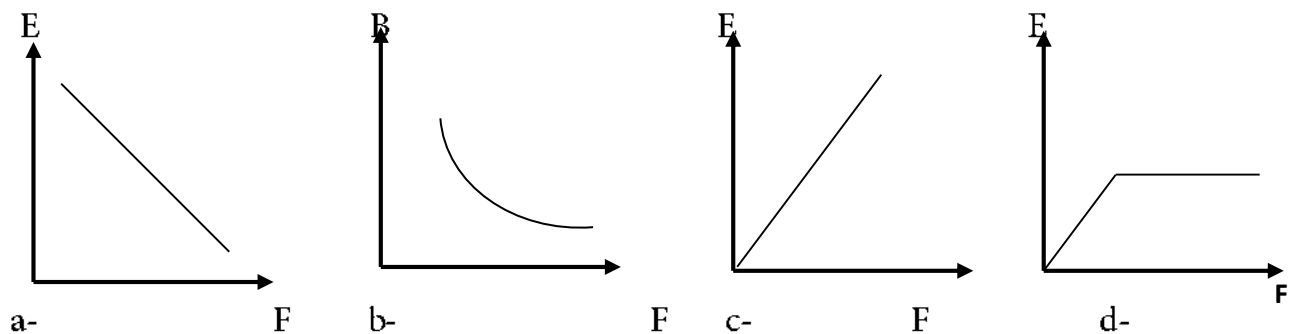
2- The photon energy equals

- a- Planck's constant \div Frequency. b- Planck's constant + Frequency.
c- Planck's constant \times Frequency. b- Planck's constant - Frequency.

3- The quanta of color has the lowest energy.

- a- blue b- violet c- green d- red

4- Which of the following graphs represents the relation between the frequency of light (F) and its energy (E)?



5- All of the following are examples of transparent media except

- a- air b- tissue paper c- glass d- clear water

6- By increasing the thickness of the transparent medium, the quantity of light that passes through it

- a- decreases b- increases
c- remains constant d- there is no correct answer





7- If the distance between a surface and light source decreases to its half, the light intensity of the surface

a- decreases to its one fourth

b- decreases to its half

c- increases twice

d- increases four times

3) Write the scientific term for each of the following:-

1- One of the components of the electromagnetic spectrum of wavelength ranges between 380 : 700 nanometers. []

2- The splitting of white light into seven spectrum colors. []

3- A structure used to separate the white light into seven spectrum colors. []

4- The color which has the lowest frequency, longest wavelength and lowest energy []

5- The color which has the least deviation and it is the closest to the prism apex. []

6- A medium doesn't allow light rays to penetrate through. []

7- The light intensity of a surface is inversely proportional to the square of the distance between the surface and the source of light. []

4) Give reason for:

1- Light can travel through space

.....

2-a clear glass is a transparent medium

.....

...

3-the intensity of light of a surface decreases to its quarter as the distance between the surface and light source is doubled





Unit two

Lesson (3)

Reflection and refraction of light

Light reflection

It is the returning back (rebounding) of light waves in the same medium on meeting a reflecting surface.

Types of light reflection

Regular reflection	Irregular (non uniform) reflection
It is the reflection of light rays in one direction when they meet a smooth (uniform) glistening reflecting surface.	It is the reflection of light rays in different directions when they when they meet a rough (non-uniform) reflecting surface.
<u>Examples smooth surface:</u> <ul style="list-style-type: none"> - plane mirror - stainless steel sheet - thin sheet of aluminum 	<u>Examples on rough surface:</u> <ul style="list-style-type: none"> - leaf of tree - piece of leather - piece of paper - piece of wool

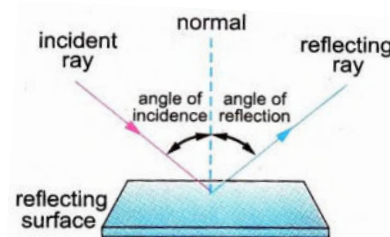




❖ Laws of light reflection

• First law

Angle of incidence = Angle of reflection.



• Second law

The incident light rays, the reflected light ray and the normal to the surface of reflection at the point of incidence, all lie in one plane perpendicular to the reflecting surface.

Definitions

The incident light ray	It is a narrow light beam which is represented by a straight line; it intersects with the reflecting surface at the point of incidence.
The reflected light ray	It is a narrow light beam which is represented by a straight line that is reflected from the reflecting surface at the point of incidence.
Angle of incidence	It is the angle between the incident light ray and the line perpendicular to the reflecting surface at the point of incidence.
Angle of reflection	It is the angle between the reflected light ray and the line perpendicular to the reflecting surface at the point of incidence.





The incident light ray which falls perpendicular on a reflecting surface reflects on itself
As the angle of incidence = angle of reflection = zero

Light refraction

It is the change of light path when it travels from a transparent medium to another transparent medium of different optical density.

Optical density of the medium

It is the ability of transparent medium to refract the light.

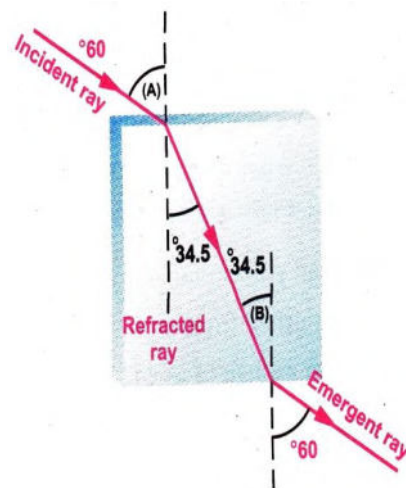
Note!

- Light refract when it changes its path due to difference of the velocity of light different transparent media.
- Each medium has its own optical density, so the optical density of a medium differs from another medium to the change in the light velocity through such medium.
- As the optical density of the medium increases the speed of light through it decreases





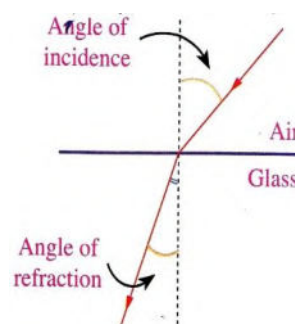
The angle of incidence	It is the angle between the incident light ray and the normal at the point of incidence on the interface.
The angle of refraction	It is the angle between the refracted light ray and the normal at the point of incidence on the interface
The angle of emergence	It is the angle between the emergent light ray and the normal at the point of emergence on the interface.



Laws of light refraction

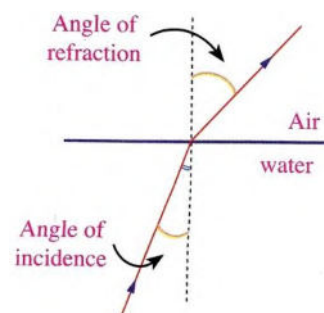
- 1- When a light ray travels from a transparent medium of lower optical density (like air or water) to another of higher optical density (like glass) it refracts near the normal.

→ The angle of incidence is greater than the angle of refraction.



- 2- When a light ray travels from a transparent medium of higher optical density (like glass) to another of lower optical density (like air or water) it refracts away from the normal.

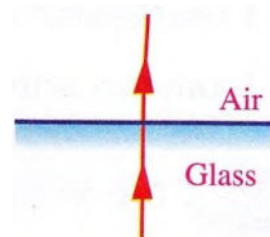
→ The angle of incidence is less than the angle of refraction.





3- When a light ray falls perpendicular to the interface between two different transparent media it passes due to the other medium without refraction.

→ The angle of incidence is less than the angle of incidence angle of refraction.



Note!

- The refraction of light through different medium depends on the optical density or velocity of light.
- There is a relation between the velocity of light through air & any other transparent medium.

Absolute refractive index of a medium

It is the ratio between the velocities of light through air to the velocity of light through another transparent medium.

$$\text{Absolute refractive index of a medium} = \frac{\text{velocity of light through air}}{\text{velocity of light through medium}}$$





Note!

- If the refractive index of a medium is high → That means that its optical density is high and vice versa.
- The absolute refractive index of any transparent medium is always greater than one.

Because the velocity of light through any transparent medium.

❖ Natural phenomena related to reflection and refraction of light.

1) Apparent shapes of objects:-

Give reason:

A pencil which is partially immersed in water appears broken?

Due to the refraction of light rays coming from the immersed part of pen in water.

2) Apparent positions of object:-

Give reason:

The submerged object in water is seen in an apparent position slightly above its real position?

Due to the refraction of light rays coming from the object (away from the normal).

As the eyes sees the extensions of these refracted rays.

Give reason:

To pick up the object in water we must look at it vertical?

Because the light passes without any refraction.

Examples:-

→ A fish in a basin seems at a position higher than its real position.





→ The bottom of the swimming pool filled with water seems higher than its true position.

3) Mirage

It is a natural phenomenon that takes place on the desert roads at noon especially in the summer times.

As objects on the road sides seem as if they have inverted images on a wet area.

Life applications:

Project of Soap bubbles Toy

The soap bubbles have spectrum color when light falls on it.

This happens by adding an amount of liquid soap to water and drops of glycerin to increase the duration of bubbles existence in air.





Homework

1- Write the scientific term:

- Smooth or rough surface at which the reflection of light takes place.
[.....]
- Angle between the incident light ray and the line perpendicular to the reflecting surface at the point of reflection. [.....]
- Ability of the transparent medium to refract the light.
[.....]
- Angle between the reflected light ray and the line perpendicular to the reflecting surface at the point of reflection. [.....]
- Angle between the emergent light ray and the line perpendicular to the point of emergence. [.....]
- The ratio between the velocity of light through air to the velocity of light through another transparent medium. [.....]
- A narrow light beam represented beam represented by a straight line that is reflected from the reflecting surface. [.....]

1- What is meant by?

- The refractive index of water is 1.3
.....
- Angle of reflection = 30°
.....
- Angle of incidence = 60°
.....
- Angle of emergence = 20°
.....

2- What happens when?

- You look to a pencil partially immersed in a cup of water.
.....
- A light ray falls perpendicular on a reflecting surface.
.....





3. Parallel light rays fall on a rough surface.

.....

4. A light ray falls on a reflecting surface by an angle 30° .

.....

5. A light ray passes from air (have lower optical density) to glass (have higher optical density)

.....

6. A light ray passes from air (have higher optical density) to glass (have lower optical density)

.....

3-Problems:

1- Calculate the absolute refractive index of water, knowing that the velocity of light through air is 3×10^8 m/s and the speed of light in water is 2.25×10^8 m/s.

.....
.....
.....

2-If the angle between the incident and reflected rays is 140° . Find the angle of incidence and angle of reflection.

.....
.....

3-If the absolute refractive index of water is $4/3$ and the velocity of light through water is 2.25×10^8 m/s calculate the velocity of light through air.

.....
.....
.....

4-Give reason for

1- The pencil which is partially immersed in water appears as being broken

.....
.....





2- When a light ray passes through a glass prism it refracts

.....

.....

3- To see a coin which has fallen in a beaker filled with water in its real position , we must look at it vertically

.....

.....

5-Choose the correct answer:

1- The angle between the reflected light ray and the incident light ray = 90° , so the angle of reflection =

- a-0 b-45 c-90 d-60

2- When the light ray falls perpendicular on the mirror so the angle of incidence =...

- a-0 b-45 c-90 d-60

3- In reflection , the reflected light rays are reflected in different directions.

- a-regular b-uniform c-total internal d-irregular

4-If the angle between the a reflected light ray and a reflecting surface is 30° , so the angle of reflection will be equal to.....

- a-15 b-30 c-90 d-60

5-The angle of incidence is greater than angle of refraction when a light travels from....

- a-air to water b-air to glass c-water to air d- a&b

6-The angle between the emergent light ray and the normal at the point of emergence on the interface is called the angle of

- a-incidence b-reflection c-refraction d-emergence





Unit three

Lesson (1)

Reproduction in plants

The flower:

- It is a short stem whose leaves are modified to form different parts of the flower.
- It is the organ of sexual reproduction in flowering plants.
- It arises from a floral bud which emerges from the axle of a leaf called bract.

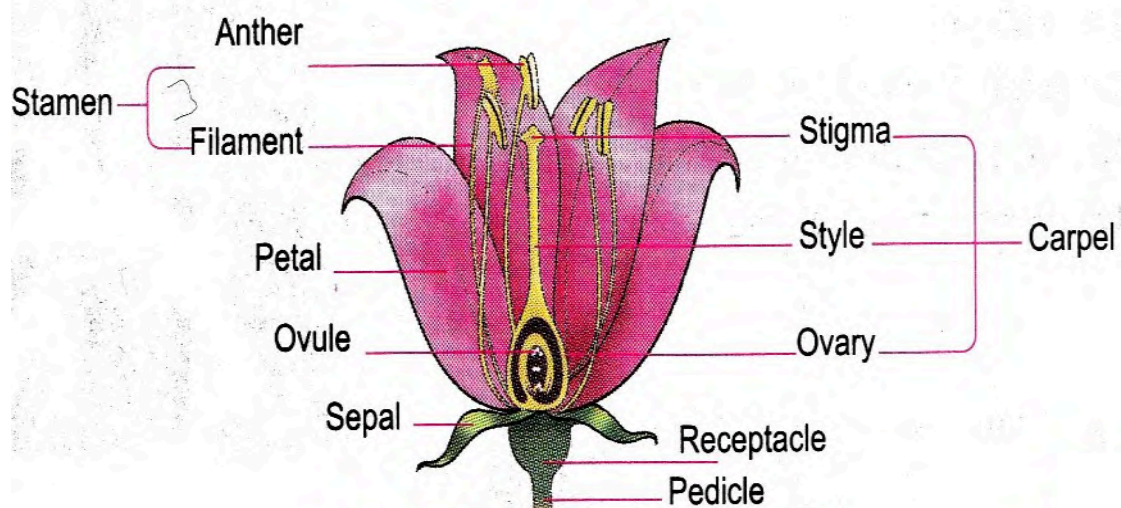
*The axle may carry a number of flowers and in this case it is known as inflorescence.

Inflorescence

It is a group of flowers arranged in the same axle

Bract:

It is the leaf from which the floral bud carrying the flower emerges.



The structure of a typical flower





* The structure of a typical flower:

*A typical flower is a flower that contains four whorls.



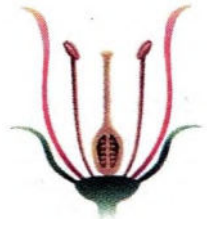
The typical flower has a thin neck (pedicle) ends in a swollen part (receptacle) which carries the floral leaves in four different floral whorls which are:

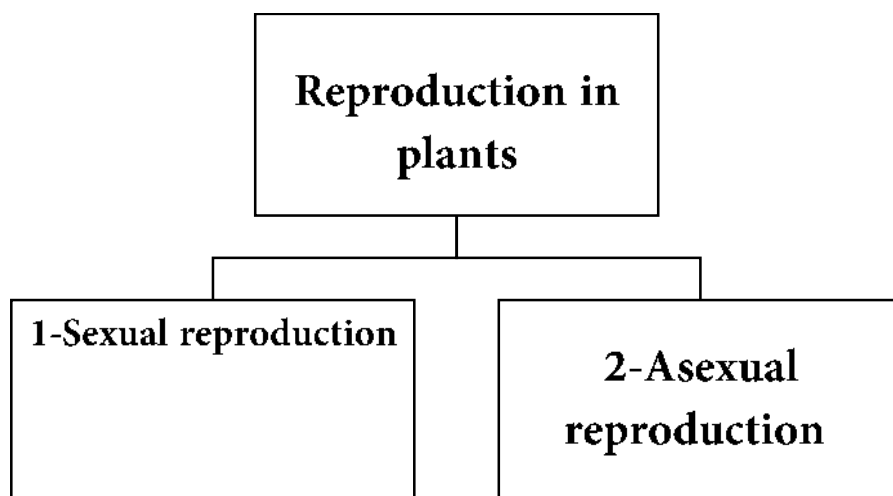
Whorl	Calyx	Corolla	Androecium	Gynoecium
Arrangement	1 st (outer) whorl	2 nd whorl	3 rd whorl	4 th whorl
Consists of	Sepals	Petals	Stamens	Carpels
description	Small green leaves surrounding the flower from outside	Colourful and scented leaves	Fine threads or filament end in a sac called anther which is divided into two parts each part has two chambers	A hollow tube like a flask consists of a swollen part called ovary connected with a tube called style which ends in an opening called stigma
function	Protection of the inner parts of the flower	*Attraction of insects *Protection of reproductive organs	Production of Pollen grains	Production of ovules.





The sex of the flower

Male flowers	Female flowers	Bisexual (hermaphrodite) flowers
They contain only male reproductive organs (stamens only) <u>Ex:</u> Palm, maize, pumpkins	They contain only female reproductive organs (carpels only) <u>Ex:</u> Palm, maize, pumpkins	They contain both male and female organs (stamens and carpels) <u>Ex:</u> Tulip, petunia, wallflower
		





1-Sexual reproduction:

It is the reproduction happens in flowers.

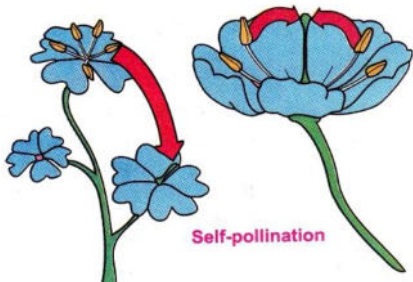
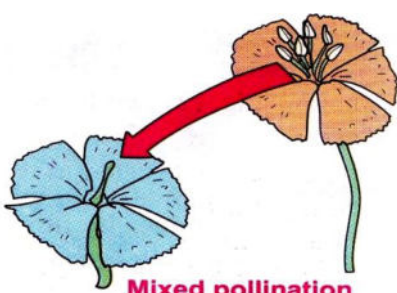
It consists of two processes (**Pollination – Fertilization**).

a) Pollination:

It is the process of transfer pollen grains from a flower to anther to the stigmas.

*The pollen grains found inside the pollen chambers.

Types of pollination

Self (auto) pollination	Mixed (cross) pollination
<p>It is the transfer of pollen grains from the anthers of a flower to the stigmas of the same flower or to another flower in the same plant.</p>  <p>Self-pollination</p>	<p>It is the transfer of pollen grains from the anthers of a flower to the stigmas of another flower or to another flower in the other part of the same kind.</p>  <p>Mixed pollination</p>





Methods of mixed (cross) pollination

Pollination by air (wind)	Pollination by insects	Artificial pollination
<ul style="list-style-type: none"> -Their anthers are hanged to be easily opened in air. -Their stigmas are feathery like to catch and sticky pollen grains from air. -They produce huge numbers of pollen grains to compensate the grains lost in air. -Their pollen grains are light in weight and dry to be easily carried by air 	<ul style="list-style-type: none"> -Their petals are colored and scented to attract insects to feed on its nectar. -Their pollen grains are sticky or having coarse surface to stick on the insect body. 	<ul style="list-style-type: none"> -It is carried by man. -as in palm trees the gardener spread the grains of male palms to another female palms. -Pollination in palms is difficult to occur by air or by insects.

b)Fertilization:

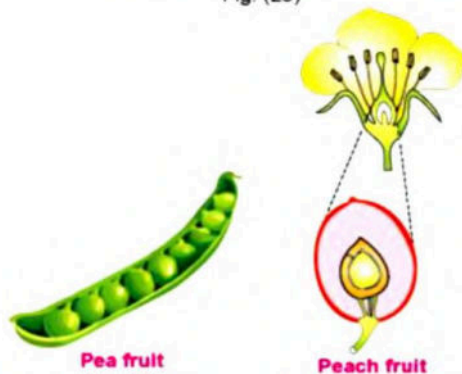
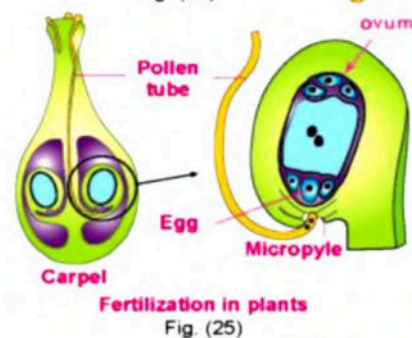
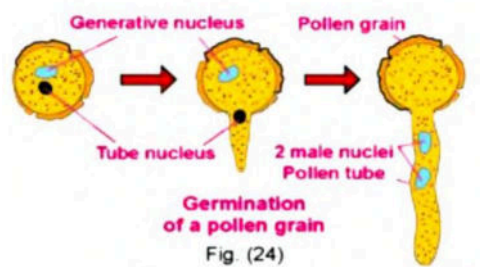
It is the process of fusion of the nucleus of the male cell (pollen grains) with the nucleus of the female cell (ovum) to form the zygote.





Stages of fertilization

- 1-After pollination, the pollen grain sticks on the stigma which secretes sugar solution.
- 2-The pollen grain germinates forming a pollen tube contains two male nuclei.
- 3-The pollen tube extends through the style till reaches the ovule inside the ovary through the micropyle.
- 4-The end of the pollen tube degenerates and one of the two male nuclei fuses with the ovum forming a fertilized ovum which known as zygote.
- 5-The zygote undergoes successive division to form the **embryo** inside the ovule.
- 6-The ovule develops and becomes the fruit.



Fruit differ from each other according to the nature of ovary.

- *The ovary that contain one ovule, gives a fruit with as (olives and peaches)
 - *The ovary that contain many ovules, gives a fruit with many seeds as (beans and peas).
- 7-After fertilization is completed, the wall of the ovule becomes the seed coat while the ovary becomes the outer coat of the fruit which is called the pericarp.





2-Asexual reproduction in plants:

Some plants have developed a special type of asexual reproduction called Vegetative reproduction.

Vegetative reproduction:

It needs the presence of root, stem, leaves or buds.

Types of vegetative reproduction

1-Natural vegetative reproduction:

It takes place by many ways such as reproduction by
(Rhizomes – Corms – tuber – bulbs – offshoots)

■ Reproduction by tuber:

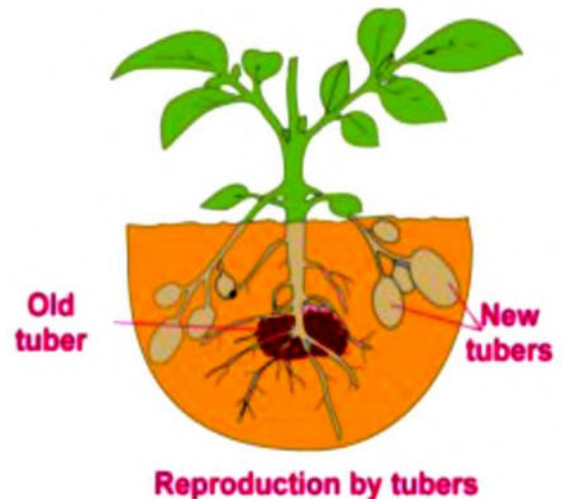
The tuber may be

*A root as (sweet potatoes)

*A stem as (potatoes)

In the tuber plants some buds grow forming a root system.

And others grow forming shoot system and after few days new tuber grow.



2-Artificial vegetative reproduction:

It takes place by many ways such as reproduction by

(Cutting – grafting – tissue culture)





■ Reproduction by cutting:

The cut:

It is the part of root, stem or leaf that taken from a plant for reproduction.

*If you cultivate some cuts

-The bud buried in the soil -----Grow to form the root system

-The bud above the soil -----Grow to form the shoot system.

Reproduction by grafting

In this type an individual plant which contains more than one bud, known as scion (graf) is selected to be placed on another individual known as the stock.

Methods of grafting:

Grafting by attachment:

In which the scion is attached to the stock.

As (mango trees)

Grafting by wedge:

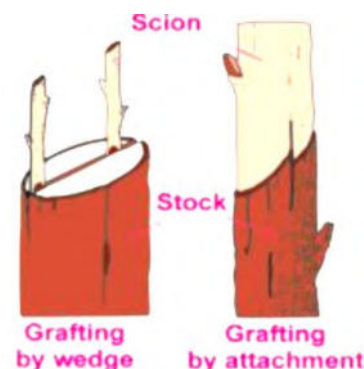
In which the scion in the form of a wedge (pencil shaped) is inserted into a cleft in the stock. As (large trees)

*In the grafting the scion and the stock are tightly tied together as the scion feed on the juice of the stock.

*The fruit produced by grafting belongs to the type of scion.

*This kind of reproduction is used only between highly similar plant species

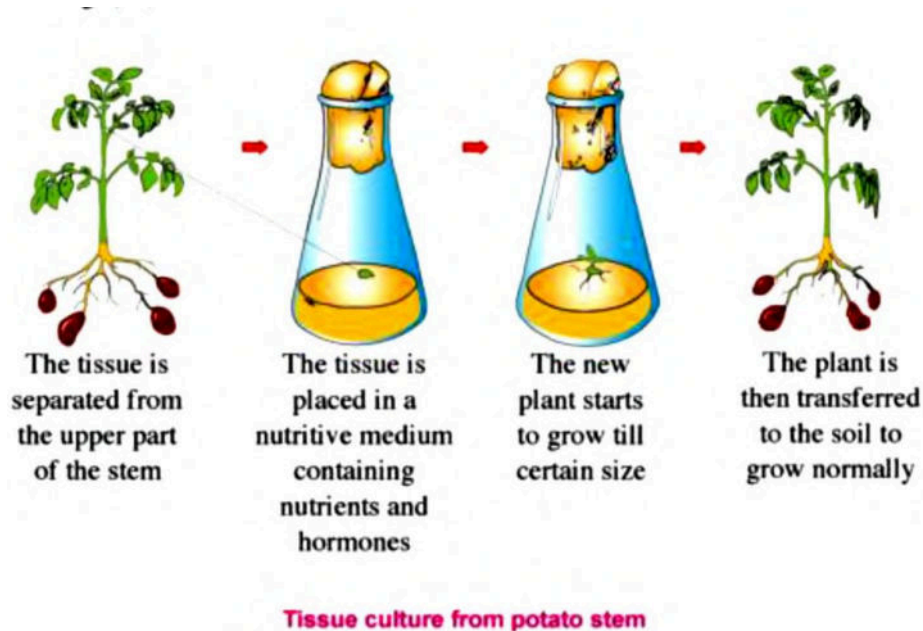
As orange and naring – apple and pears – peaches and apricot





Tissue culture:

It is a process of multiplying a small part of a plant to get many identical parts.





Homework

1- Complete the following statements:

- 1- The flower is protected of and
- 2- The flower is protected by leaflets called which form..... part.
- 3- The calyx is a group of leaflets, each of them is called
- 4- The female reproduction organs in the flower are
- 5- The pollen grain germinates on forming.....

2- Write the scientific term:

- 1- An organ that is formed from the flowers ovary when its tissues store food.
[]
- 2- A short stem whose leaves have modified to carry out the reproductive organ.
[]
- 3- Small particles that spread in the air to fertilize the ovules in plant.
[]
- 4- Four pollen sacs containing pollen grains that form a plant organ.
[]

3- Look at the opposite figure and answer the question

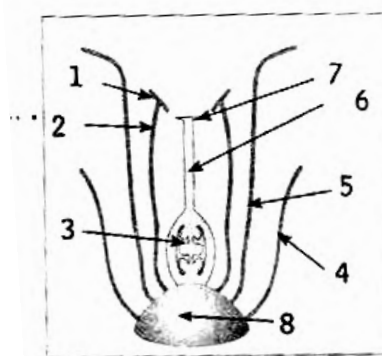
*This flower is called bisexual because it contains and

- 1- Write the names of parts (1,2,3,4,5,6,7,8).

1- 2-

3- 4-

5- 6-





3- Organ No. (3) is and after fertilization . it forms.....

4- From the opposite figure , answer the following questions :

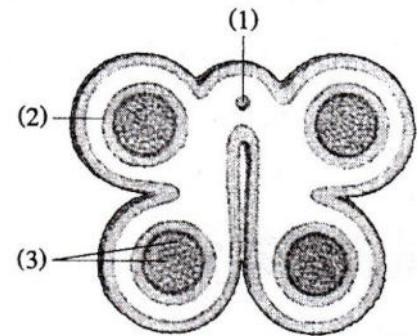
1- The figure represents a cross section in an

2- Label the figure

1)

2)

3)



6- A) Compare between :

Self-pollination	mixed pollination

b) Choose from column (B) what suits it from column (A) :

(A)	(B)
1- Sepal 2- Petal 3- Pollen grain 4- Stamen 5- Ovule	a- is a colored leaflet b- is a female cell c- forms the androecium d- is a male cell e- is a green leaflet f- forms the fruit





7- Give reasons for each of the following:

a- The stigmas of flowers are mostly sticky.

.....
.....

b- The nucleus of the egg cell contains one half of the hereditary substance.

.....
.....

c- The flowering plants are called seed-covered plants (angiosperms).

.....
.....

d- The petals of flower are colored and mostly contain nectary buckets at their bases.

.....
.....

e- Bean's flower is a typical bisexual flower.

.....
.....

f- Pollination by air is done in case of the feathery anthers.

.....
.....

8- Choose the suitable answer:

1- The floral leaves exist on a swollen part upon the flower pedicel called

(ovary – receptacle – calyx – corolla)

1- In large colored flowers, the pollination is done through.....

(air – insects – water – man)





2- Pollination is occurred in palm trees through.....

(insects – wind – man)

3- The male organs of flower are the (stamens – pistils – sepals)

4- The female organ of flower is called

(pistil – receptacle – stamen – petal)

5-The potato tuber is a(stem – root – bud – leaf)

6-The innermost whorl of the male flower is the

(gynoecium – androecium – corolla – calyx)

12- put (✓) or (✗) and correct the wrong :

1- The calyx is composed of modified leaflets called stamens. ()

2- The pistil is composed of stigma, style and ovary. ()

3- The genetic substance is combined for the same species as a result of the Joining of the sperm and the ovum. ()

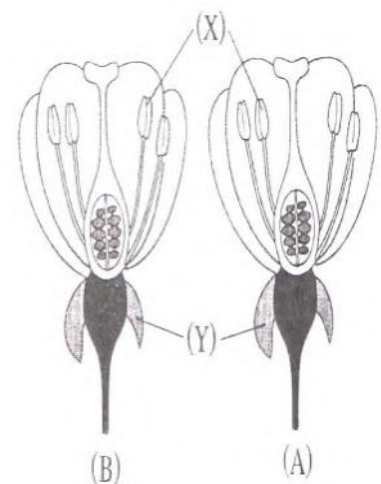
4-The ovary of beans fruit contains one ovule ()

Examine the following figure ,then answer:

1- what is the function of the part (X)

2-what happens if a pollen grain from the flower (B) is transferred to the stigma of the flower (A)

3- what is the sex of the flower (A)



حمل الآن

مجاناً وحصرياً

المراجعة رقم (4)

اختبار شهر مارس



Unit two: sound and light

Lesson one: properties of sound waves

Sound:

It is an external factor that affects the ear causing the sense of hearing

- Sound waves are mechanical longitudinal waves.

Mechanical waves, because: they need a medium to propagate through.

Longitudinal waves, because: the medium particles vibrate in the same direction of wave propagation forming compressions and rarefactions.

Sound velocity:

- Sound travel through air a velocity 340m/sec.

Sound wave velocity (v) = Frequency (F) * Wave length (λ)

For example:



Sound waves are produced from a vibrating tuning fork of frequency 512 cycles/sec. if the wavelength of these waves is 60cm , calculate its velocity through air.

Solution:

Sound wave velocity (V) = wave frequency (F) * wavelength (λ)

$$512 * \frac{60}{100} = 307.2\text{m/sec.}$$

Audible sounds:

Musical tones	Noises
<ul style="list-style-type: none">❖ They are tones of uniform frequency and comfortable to be heard.❖ Violin , piano and reed pipe. 	<ul style="list-style-type: none">❖ They are sounds of non – uniform frequency and uncomfortable to be heard.❖ Drill, loudspeakers and horns of cars. 

Properties of sound waves:

1. Sound pitch
2. Sound intensity
3. Sound quality(type)

1) Sound pitch:

It is the property by which the ears can distinguish (differentiate) between harsh and sharp voices.

❖ Sound is described as high pitched sound or low pitched sound.

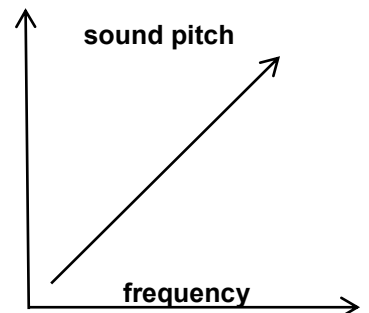
High pitched sound is sharp	Low pitched sound
❖ The voice of woman high pitched as it sharp.	❖ The voice of man is low pitched as it is hard.

- the voice of the lion is harsher than that of sparrow.

The relation between the sound pitch with sound frequency:

The sound pitch depends on the frequency of the sound source.

The **sound pitch** increases by increases the frequency and vice versa.



producing sound from vibration of air column:

in case of vibration of air column, the sound pitch depends on the length of the vibrating air column.

As the length of the vibrating air column increase, the sound frequency decrease so the harshness of sound increase.



As the length of the vibrating air column decrease, the sound frequency increase so the sharpness of sound increase



Deter

Frequency increases by decreases the length of air column and vice versa

1. listen to the tone you want to determine its pitch till your ears get to it.
2. Rotate savart's wheel at the time one if the gears teeth contacts a flexible metallic sheet
3. Increase the speed of rotation till you hear a sound to that of the unknown tone
4. Calculate the number of cycles taking place in a specific duration and by knowing the number of gear teeth you can determine the frequency of the tone as follows:

$$\text{Sound frequency (F)} = \frac{\text{Number of cycles (turns)}(d) * \text{number of gear teeth (n)}}{\text{time in seconds}}$$

For example:

Calculate the frequency of a musical tone similar to the frequency of a produced tone using savart's wheel rotated with a velocity of 960cycles in two minutes, given that the number of teeth of the gear is 30 teeth.

Solution:

$$\text{time (t)} = 2 * 60 = 120 \text{seconds.}$$

$$\text{Frequency (F)} = \frac{\text{No.of cycles} * \text{No.of gear teeth}}{\text{time in sec.}} = \frac{960 * 30}{120} = 240 \text{Hz}$$

2) sound intensity:

Sound intensity:

It is the property by which the ears can distinguish between strong or weak sounds.

The measuring unit of sounds intensity is watt/m²

- Whispering is described as a weak sound - shouting is describing as a strong sound

So that, the intensity of sound at a certain point is measured by the quantity of sound energy falling perpendicularly in one second on a unit area at that point.

- ❖ The measuring unit of the level of sound intensity (noise intensity) is **decibel**.

Factors affecting the sound intensity

1. The distance between the ear and the sound source.
2. The amplitude of vibration of the sound source.
3. The area of vibrating surface.
4. The medium density through which the sound travels.
5. The wind direction.

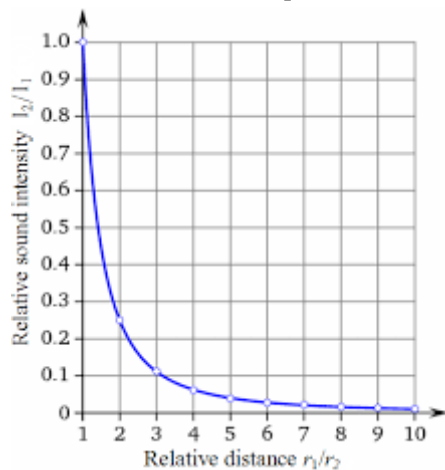
1. The distance between the ear and the sound source:

The intensity of sound is inversely proportional to the square of the distance (d^2) between that point and the source this known as: "The inverse square law of sound"

The inverse square law of sound:

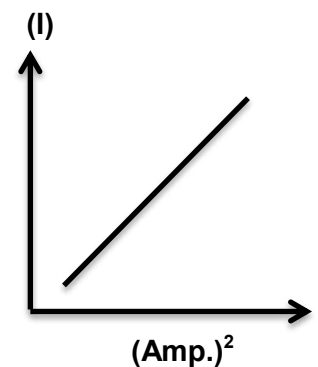
The intensity of sound at a point is inversely proportional to the distance between that point and the sound source.

$$\text{Sound intensity} = \frac{1}{\text{square of the distance}}$$



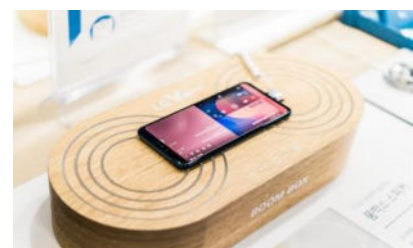
2. The amplitude of vibration of the sound source:

The sound intensity is **directly proportional** to the square of the amplitude of the sound source.



3. the area of the vibrating surface:

sound intensity increases by increasing the vibrating surface area when the source of sound touches a resonance body.



4. The medium density:

- Sound intensity **decrease** by decreasing the density of the medium and vice versa.
- Sound intensity is **directly proportional** to the medium in which sound travels.

5. The wind direction:

The intensity of sound **increase** when the direction of sound waves propagation is in the **same direction** of wind.

The intensity of sound **decreases** when the direction of sound waves propagation is in **opposite direction** of wind.

3) sound quality (type):

Sound quality:

It is the property by which the human ear can distinguish between different sounds according to the nature of the source even if they are equal intensity and pitch.

The complex tones: are composed of a fundamental tone associated by other tones higher in pitched and lower in intensity known as “**harmonic tones**”.

For example: the tone produced from a violin or a piano.



The fundamental tone: the tone produced from a vibrating tuning fork which is the pure simple tone.



Harmonic tones:

They are tones that accompany the fundamental tone but they are higher pitch and lower in intensity, and differ from one instrument to another.

Sound waves

Infrasonic waves	Sonic waves	Ultrasonic waves
they are sound waves of frequencies lower than 20Hz such as the waves accompany the blowing of storms that precede rainfall and the human ear cannot hear them	They are sound waves of frequencies ranging from 20Hz to 20KHz Such as The waves that human ear can distinguish between them and can hear them	They are sound waves of frequencies higher than 20KHz Such as Some animals such as bats, dogs and dolphins can hear ultrasonic waves and the human ear cannot hear them

- Dogs can hear all sounds produced by man (G.R.)

Because, the range of sounds produced by man lies within the range of sounds heard by dogs.

- Man can't hear sounds produced by a dolphin (G.R.)

Because a dolphin produced ultrasonic waves, while the human ears can't hear sounds of frequencies more than 20 Kilohertz.

Ultrasonic waves are used in several medical, industrial and military fields such as:

Medical	1. Breaking down kidney and stones without any ureter stones without any surgical interventions 2. Diagnosis of male prostate gland tumors and its effect on bladder. 3. Discovering malignant tumors.
Industrial	Sterilization of food, water and milk as ultrasonic waves are characterized by their high ability to kill some types of bacteria and stop the action of some viruses.
Military	The discovery of landmines..

Revision on lesson one

1. Choose the correct answer:

1. A sound travels in air with velocity 330metre/sec. and has a wavelength 0.1metre, its frequency equals.....
a. 330Kilohartz b. 3300Hertz c.33Kilohertz d.330hertz
 2. Sound of frequency 200Hz is than the sound of frequency 100Hz.
a. stronger b. sharper c. weaker d. harsher
 3. All of the following are factors affecting sound intensity, except the
a. amplitude of vibration b. medium density
c. frequency d. wind direction.
 4. The human ear can distinguish sounds of frequency.....
a. 50KHz b. 30KHz c.300Hz d.5 Hz.
-

2) Give Reason for:

1. Sound travelling in air has less intensity than that travelling in carbon dioxide.

.....
.....

2. The intensity of sound decrease as the amplitude of vibrating source decrease.

.....
.....

3. We hear sound from all direction that surround the sound source.

.....
.....

3) Write the scientific term:

1. The measuring unit of sound intensity. ()
 2. The intensity of sound at a point varies inversely with the square of the distance between that point and sound source. ()
-

- 4) Savart's wheel rotates with a rate of 300 cycles per minute. A sound of frequency 600Hz is produced when an elastic plate touches the teeth of one gear. Calculate the number of teeth of the gear.

Lesson two: Wave nature of light

Light:

It is an external factor that affects the eye causing the sense of vision.

Nature of light waves:

Light waves are electromagnetic transverse waves (G.R.)

They are electromagnetic waves, bec. they propagate through vacuum

They are transverse waves, Bec. the medium particles vibrate perpendicular to the direction of the wave propagation forming crests and troughs.

- The speed of light waves through vacuum = 3×10^8 m/sec

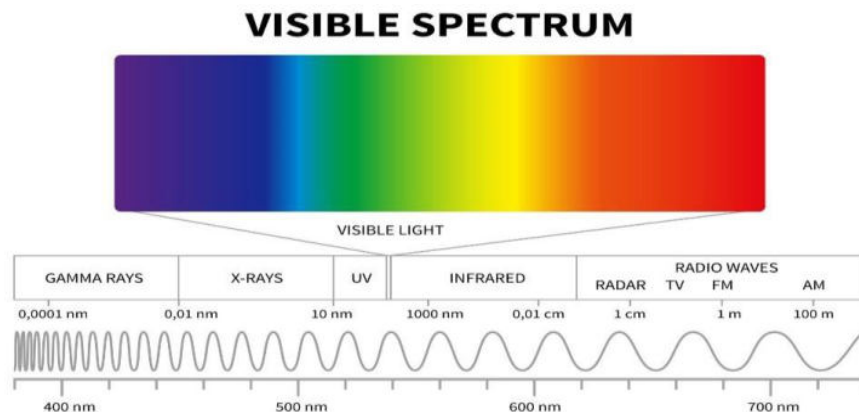
The speed of light:

it is the distance covered by light in one second.

$$\text{Speed of light} = \frac{\text{distance (m)}}{\text{time (sec.)}}$$

The visible light:

It is one of the components of electromagnetic spectrum of wavelength ranges between 380:700 nanometre.



Analysis of white light:

Analysis of white light:

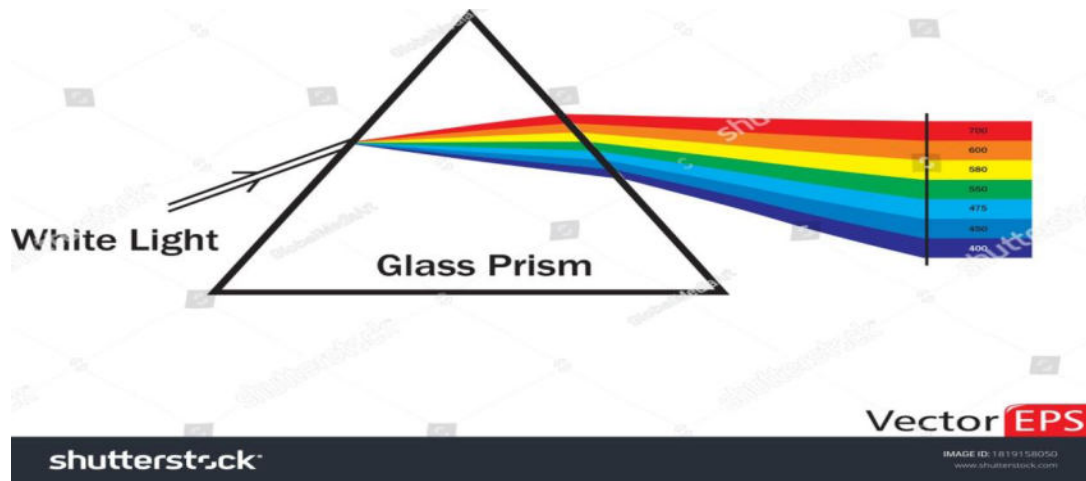
It is the splitting of white light into seven colours called spectrum colours.

- White light consists of mixture of seven colors which are known as “spectrum colors”

These colors are Red , orange , yellow , Green , Blue , indigo , Violet.

When the white light falls on a triangular glass prism , it is analysed into seven spectrum colours which are constant in speed and different in:

- Wavelength
- frequency
- Angle of deviation



The lowest deviation (is the closest to the prism apex) → Red, Which is the lowest frequency (longest wavelength)

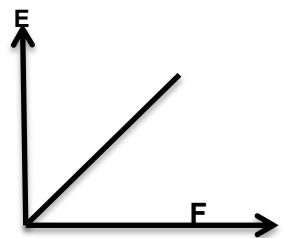
The highest deviation (the closest to the prism base) → Violet which is the Highest frequency (shortest wavelength)

Energy of light waves:

The German scientist max plank proved that:

- The energy of light waves is composed of energy quanta Known as “photons”
- The energy of the photons (E) is directly proportional to the frequency of the light wave (F)

$$\text{Photon energy} = \text{plank's constant} * \text{photon frequency}$$



Light is used in home decoration like:

Spot lights → used to illuminate aircrafts

Ornamented lamps → that bring happiness and joy to the place

Stand lamps → that concentrate light for reading

Light behavior through different media:

Media can be classified to their ability to allow light to pass through; into:

Transparent medium	Translucent (semi-transparent) medium	Opaque medium
<p>Transparent medium: It is the medium, which permits most light to pass through</p> <p>Objects can be seen very clearly through medium.</p> <p><u>Examples:</u> the clear glass Air Pure water</p>	<p>Translucent medium: It is the medium, which permits only a part of light to pass through and absorbs the remaining part.</p> <p>Objects can be seen through transparent medium less clearly than the transparent one.</p> <p><u>Examples:</u> Frosted glass Tissue paper</p>	<p>Opaque medium: It is the medium, which doesn't permit light to pass through</p> <p>Objects can't be seen through opaque medium.</p> <p><u>Examples</u> Plant leaves Books Milk Carton Black honey Wood Metals Human skin Foil paper</p>

Light travels in straight lines:

Light travels through transparent media in the form of straight lines whose size can be controlled

- The quantity of light falling perpendicular to a unit area of a surface in one second is called "light intensity"

Light intensity:

It is the quantity of light falling perpendicular to a unit area of a surface in one second.

Light intensity of a surface decrease as the distance between the surface and the light source increase according to "the inverse square law"

The inverse square law:

The light intensity of a surface is inversely proportional to the square of the distance between the surface and the source of light

$$\text{Light intensity} \propto \frac{1}{d^2}$$

Revision on lesson two

1)choose the correct answer:

1. Light waves are Waves.

- | | |
|---------------------------------|-------------------------------|
| a. mechanical transverse | b. electromagnetic transverse |
| c. electromagnetic longitudinal | d. mechanical longitudinal |

2. Photon energy = plank's constant *

- | | |
|---------------------|----------------------|
| a. Photon frequency | b. photon wavelength |
| c. amplitude. | d. photon velocity. |

3. The human skin is considered as a/an medium.

- | | | | |
|----------------|-----------|---------------|---------------------|
| a. transparent | b. opaque | c. transverse | d. semi-transparent |
|----------------|-----------|---------------|---------------------|

4. Light travels in lines.

- | | | | |
|-----------|-------------|-------------|-----------|
| a. curved | b. circular | c. straight | d. zigzag |
|-----------|-------------|-------------|-----------|

5. When the distance between the source of light and the surface of a wall decreases, the light intensity on the surface.....

- | | | | |
|-------------|-------------|---------------|---------------------|
| a. decrease | b. increase | c. is doubled | d. remains constant |
|-------------|-------------|---------------|---------------------|

2)Write the scientific term of each of following

- | | | |
|--|---|---|
| 1. The main source of light energy on the Earth's surface. | (|) |
| 2. A mixture of seven spectrum colours. | (|) |
| 3. The colour which has the highest frequency, shortest wavelength | (|) |
| 4. A medium doesn't allow light rays to penetrate through. | (|) |

Give reason for:

1. The energy of red light photon is less than that of orange light photon.

.....

2. A clear glass is a transparent medium.

.....

3. A tissue paper is a transparent medium.

.....

4. The in ability to see the impurities present in black honey

.....

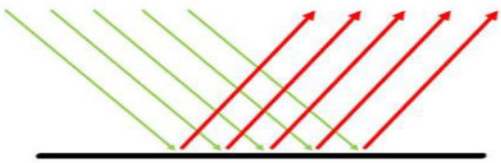
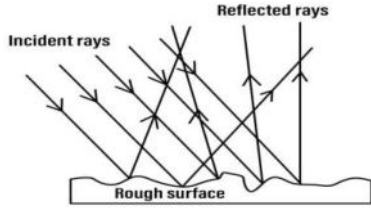
Lesson three: Reflection and Refraction of light

1. Light Reflection:

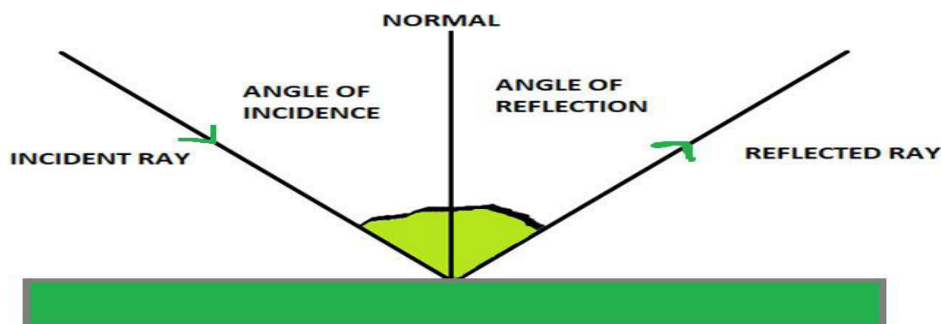
Light Reflection:

It is the rebounding (Returning back) of light waves in the same medium on meeting a reflecting surface.

Types of light reflection:

Regular (uniform) reflection	Irregular (non- uniform) reflection
<p>Regular reflection:</p> <p>It is the reflection of light rays when they meet (fall on) a smooth (uniform), where the incident light rays are reflected in one direction.</p>  <p>The diagram shows a horizontal line representing a smooth surface. Several parallel green lines (incident rays) approach the surface from the left. They are reflected as several parallel red lines (reflected rays) moving away from the surface to the right. The label 'Regular Reflection' is centered below the surface line.</p> <p>Examples:(of smooth surfaces): A plane mirror. A thin sheet of aluminium (foil). A stainless steel sheet.</p>	<p>Irregular reflection:</p> <p>It is the reflection of light rays when they meet (fall on) a rough (non-uniform) and where the incident light rays are reflected in different (many) directions.</p>  <p>The diagram shows a horizontal line representing a rough surface with small bumps. Several parallel green lines (incident rays) approach the surface from the left. They are reflected as several non-parallel black lines (reflected rays) moving away from the surface in different directions. The labels 'Incident rays' and 'Reflected rays' are at the top, 'Rough surface' is below the surface line, and 'Irregular or diffused reflection' is at the bottom.</p> <p>Examples:(of rough surfaces): A leaf of a tree. A piece of paper. A piece of leather. A piece of wool.</p>

Laws of light reflection:

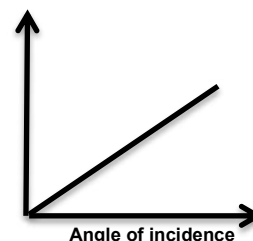


1. **The incident light ray:** it is the light beam which is represented by a straight line, it intersects with the reflecting surface at the point of incidence.

2. **The reflected light ray:** it is a narrow light beam which is represented by a straight line, it is reflected from the reflecting surface at the point of incidence.
3. **Angle of incidence:** it is the angle between the incident light ray and the line perpendicular to the reflecting surface at the point of incidence.
4. **Angle of reflection:** it is the angle between the reflected light ray and the line perpendicular to the reflecting surface at the point of incidence.

The reflection of light is governed by two laws: _____ angle of reflection

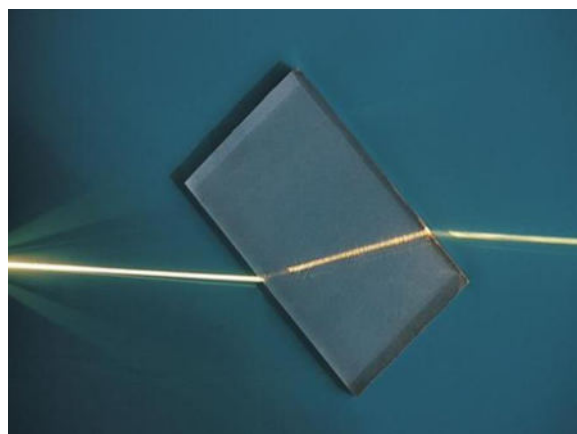
First law: Angle of incidence = Angle of reflection.



Second law: the incident light ray, the reflected light ray and the normal to the surface of reflection at the point of incidence, all locate in one plane perpendicular to the surface.

Light refraction:

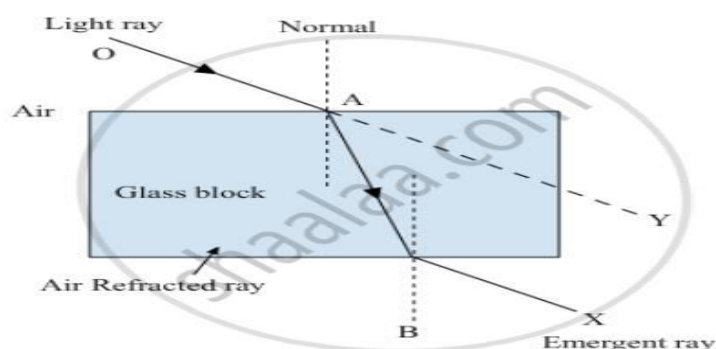
It is the change of light path when it travels from a transparent medium to another transparent medium of different optical density.



Optical density of the medium:

It is the ability of the transparent medium to refract light.

Concepts related to light refraction:



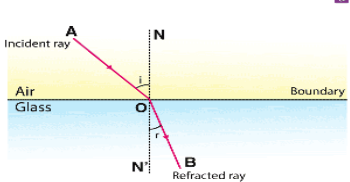
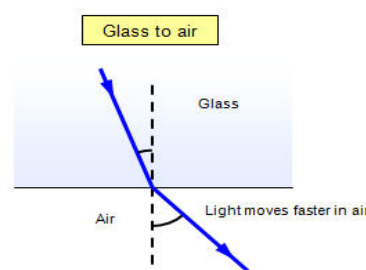
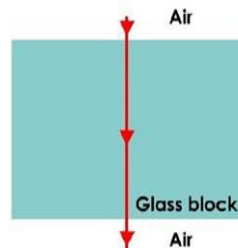
Angle of incidence: it is the angle between the incident light ray and the normal at the point of incidence on the interface.

Angle of refraction: it is the angle between the refracted light ray and the normal at the point of incidence on the interface

Angle of emergence: it is the angle between the emergent light ray and the normal at the point of emergence on the interface.

Laws of light refraction:

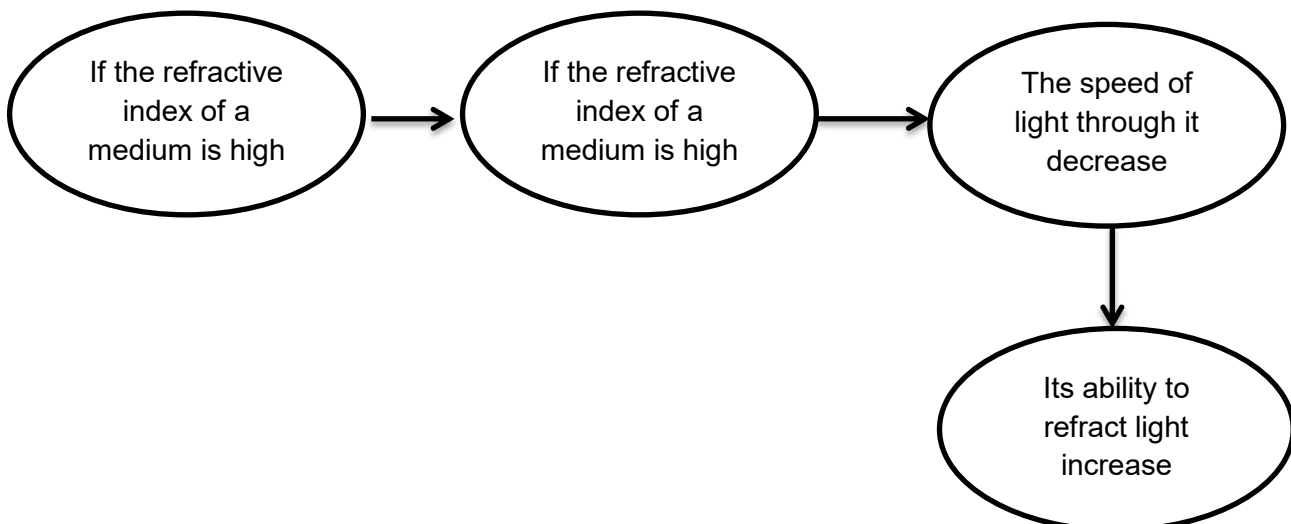
The path of a light falls on the interface between two transparent media differ in their optical densities.

When a light ray travels from a transparent medium of lower optical density (like air or water) to another of higher optical density (like glass)	When a light ray travels from a transparent medium of higher optical density (like glass) to another of lower optical density (like air)	When a light falls perpendicular to the interface between two different transparent media.
<p>The light ray refracts near the normal</p>  <p>The angle of incidence is greater than the angle of refraction</p>	<p>The light ray refracts far from the normal</p>  <p>The angle of incidence is smaller than the angle of refraction.</p>	<p>The light ray passes without rarefaction.</p>  <p>The angle of incidence is equal to the angle of refraction equals zero.</p>

Absolute refractive index of a medium:

It is the ratio between the velocity of light through air to the velocity of light through another transparent medium.

$$\text{Absolute refractive index of a medium} = \frac{\text{velocity of light through air}}{\text{velocity of light through the medium}}$$



For Example:

If the velocity of light through water is $2.25 \times 10^8 \text{ m/s}$, calculate the absolute refractive index of water. Knowing that the velocity of light through air is $3 \times 10^8 \text{ m/s}$.

Solution:

$$\text{The absolute refractive index of water} = \frac{\text{velocity of light through air}}{\text{velocity of light through water}} = \frac{3 \times 10^8}{2.25 \times 10^8} = 1.33$$

Apparent shapes of objects:

A pencil, which is partially immersed in water, appears as being broken.

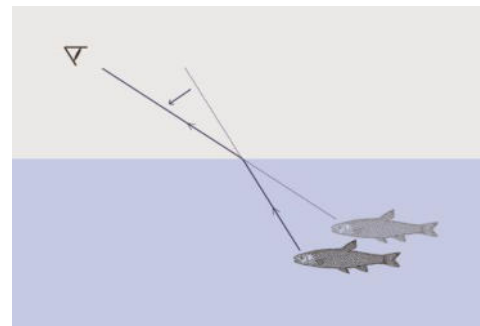
Due to the refraction of light rays coming from the immersed part in water.



Apparent positions of objects:

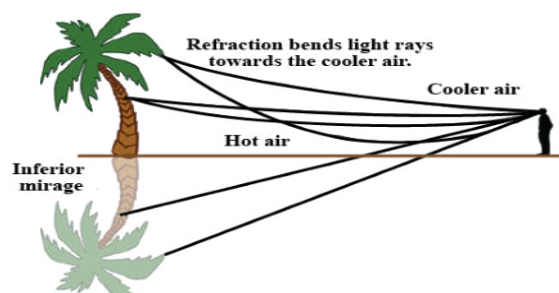
The submerged object in water is seen in an apparent position slightly above its real

Position



Mirage:

It is a natural phenomenon that takes place on the desert roads at noon especially in the summer times, where objects on the road sides seem as if they have inverted images on a wet area.



Revision on lesson three

Write the scientific term:

1. The reflection in which the light rays recoil in many directions when falling on a rough surface. ()
 2. The angle between the reflected light ray and the normal at the point of incidence on the separating surface. ()
 3. The ability of the medium to refract light rays. ()
 4. Changing the path of light when it travels from a transparent medium to another transparent medium of different optical density. ()
 5. The ratio between the velocities of light through air to the velocity of light through transparent medium. ()
-

Complete the following:

1. when a light ray travels from a transparent medium of higher optical density to another of lower density, the angle of..... is more than the angle of
 2. Light is the change of light path when it travels from a transparent medium to another one of different.....
-

Give reason for:

1. The light that falls perpendicular on a glistening surface reflects on itself.

.....

2. When the light ray travels from air to water it refracts near to the normal.

.....

3. Occurrence of mirage phenomenon in desert regions at noon.

.....

What happen if..?

1. A light ray falls perpendicular to the interface between two transparent media of different optical densities.

.....

Problems:

1. if the angle between the incident light ray and the reflected light ray is 140° , find the angle of incidence and the angle of reflection.

.....

2. calculate the absolute refractive index of diamond given that the speed of light through it is $1.25 \times 10^8 \text{ m/s}$. (knowing that the velocity of light through air is $3 \times 10^8 \text{ m/s}$)

Revision on unit two

1) write the scientific term:

1. Sound waves of frequencies less than 20Hz. ()
2. A medium does not allow light rays to penetrate through. ()
3. Changing the path of light when travel from a transparent medium to another transparent medium of different optical density. ()

2) choose the correct answer:

1. Sound of frequency 200Hz is than sound of frequency 100Hz.
a. sharper b. stronger c. harsher d. weaker
2. When the distance between the source of light and the surface as a wall decreases , the light intensity on the surface.....
a. decrease b. increase c. doubled d. remains constant

3) write down the mathematical relation that joins between each of the following:

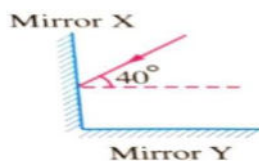
1. The photon frequency and its energy.
.....
2. The sound frequency (F), the number of teeth of each of the gear in savart's wheel (n).
.....

4) what are the results due to each of the following...?

1. Incidence of light rays on a rough surface.
.....
2. Incidence of a white light ray on one face of a triangular glass prism.
.....

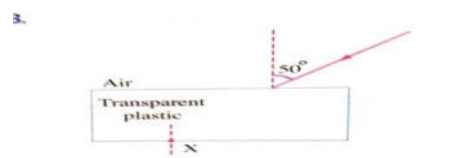
5) complete the path of rays in each of the following figures according to what is written below each:

A)



Determination of the angle of reflection
of the ray on mirror (Y)

B)



calculate the angle of emergence
from point (X)

Unit three: Reproduction and continuity of species

Lesson one: Reproduction in plants

Reproduction process:

It is a vital process that aims to secure the existence and continuity of living organisms species by producing new individuals of the same species to prevent them from.

Reproduction in plants:

1. Sexual reproduction
2. Asexual Reproduction

First: Sexual Reproduction in plants:

Flower:

It is a short stem whose leaves are modified to form genital organs which in turn form inside fruits.

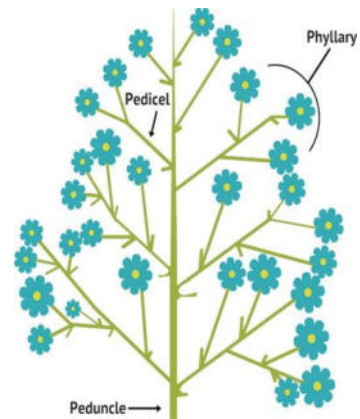
Origin of the flower:

Bract:

It is the green leaf, where the floral bud emerges from its axle and developed into a flower.

Inflorescence:

It is a group of flowers carried on the same axle.

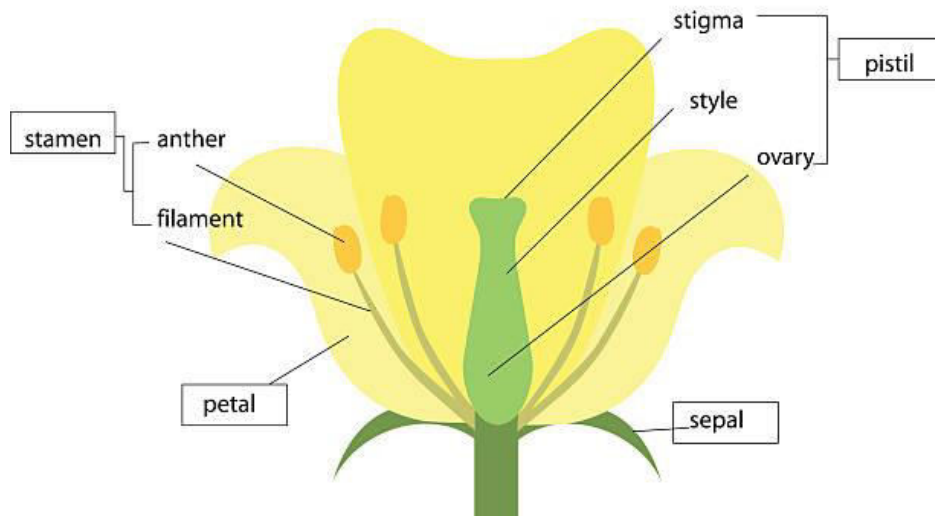


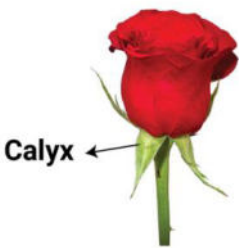

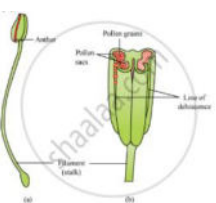

The structure of the flower:

Receptacle:

It is the swollen part upon the flower pedicle, on which the floral leaves are existed.

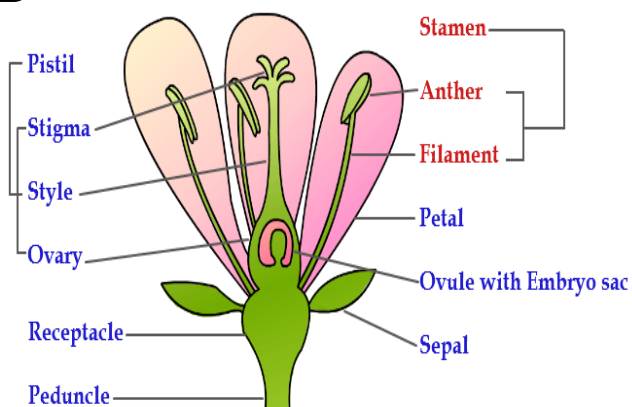
The Structure of a Flower



Whorl	Calyx	corolla	Androeceium	Gynoeceium
Consists of and Description :	<p>It consists of a group of green leaves each leaf is called a "sepal"</p> 	<p>It consists of a group of bright colored scented leaves, each leaf is called a "petal"</p> 	<p>It is the male reproductive organ of the flower. Its leaves are known as "filament" ends in a sac known as the anther, which is divided into two parts, each part has two chambers containing pollen grains.</p> 	<p>It is the female reproductive organ of the flower. Its leaves are Known as "carpels" which resemble the flask in shape. Each carpel consists of a swollen part called the ovary, which is connected with a tube called the style, which ends in an opening called the stigma.</p>  <p>Figure 4.32: Pistil</p>
Function:	<p>it protects the inner parts of the flower specially before blooming</p>	<p>It protects the reproductive organs. It attracts insects to the flower, which help in reproduction.</p>	<p>It produces pollen grains</p>	<p>It produces ovules</p>

Typical flower:

It is the flower that contains four floral whole.



The sex of flower:

Bisexual flower:

Flower that both male and female reproductive organs

Unisexual flower:

Flower that carries either male or female reproductive organ only.

Flower	Hermaphrodite flower	Male flower	Female flower
Reproductive organs	Bisexual and carpel	unisexual	unisexual
Reproductive organs	Stamen and carpel	Stamen only	Carpel only
Number of floral whorls	4	3	3
Examples	Flowers of most plants such as: Flax Tulip Petunia Wallflower Peas Sunflower.	Flowers of some plants such as: Palms Maize Pumpkins	

Steps of sexual reproduction in plants:

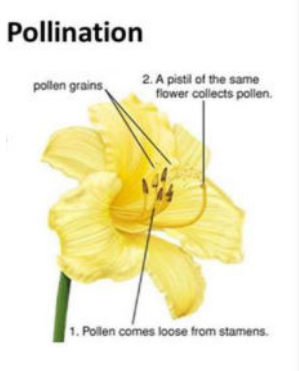
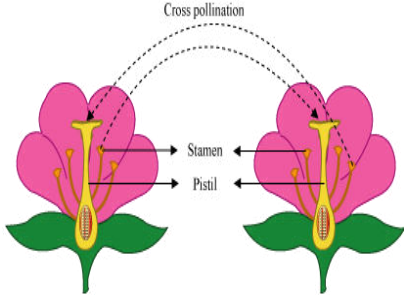
1. Pollination

2. Fertilization.

Pollination:

It is the process of transfer of pollen grains from the anthers of a flower to the stigmas.

Types of pollination:

Self pollination	Mixed pollination
<p><u>Self pollination:</u> It is the transfer of pollen grains from the anthers of a flower to the stigmas of another flower in the same plant.</p> <p>Pollination</p>  <p><u>Reasons of occurrence:</u> Flowers must be bisexual and characterized by one of the following: Anthers and stigma are matured in the same time, such as flax plant. Non-blooming flowers until completion of fertilization process, such as barley plant.</p>	<p><u>Mixed pollination:</u> It is the transfer of pollen grains from the anthers of a flower to the stigmas of another flower in other plant of the same kind.</p>  <p><u>Reasons of occurrence:</u> The flower is bisexual and its anthers and stigmas are not matured at the same time, such as sunflower plant. The flower is unisexual, such as maize plant.</p>

Methods of mixed pollination:

1. Pollination by air (wind)
2. Pollination by insects
3. Artificial pollination
4. Pollination by air:

Stigmas: they are feathery like and sticky → to catch pollen grains from air.

Anthers: they are hanged → to be easily opened by air.

Pollen grains: they are produced by huge number → to compensate what are lost in air.

Pollination by insects:

Petal: it is colored and scented → to attract insects feed on its nectar.

Pollen grain: it is sticky or having coarse surface → to stick on the insect body.

Artificial pollination:

This method of pollination is carried out by man.

For example: the gardener in pollination process of palm trees

Fertilization:

Stage (1)————→ After pollination the pollen grain sticks on the stigmas which secretes sugary solution.

Stage (2)————→ the pollen grain germinates forming a pollen tube.

Stage (3)————→ the pollen tube extends through the style till it reaches the ovule inside the ovary through the micropyle.

Stage (4)————→ the end of the pollen tube degenerates and one of 2 male nuclei fuses with the ovum forming a fertilized ovum which is known as “zygote”.

Fertilization in plants:

It is the process of fusion of the nucleus of the male cell with the nucleus of the female cell to form the zygote.

Zygote:

the cell resulting from the fusion of a pollen grain and an ovum nuclei.

Formation of seeds and fruits:

After completion of fertilization process:

The wall of the ovary: it develops to become the outer coat of the fruit which is called “pericarp”

The wall of the ovule: it develops to become the seed coat.

The ovary: it develops to become a fruit.

The ovule: it develops to become a seed.

Second: Asexual reproduction in plants:

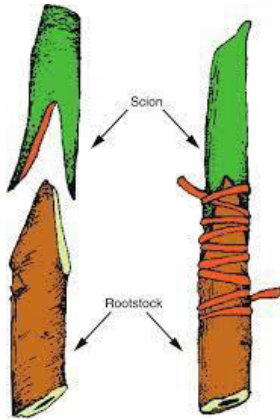
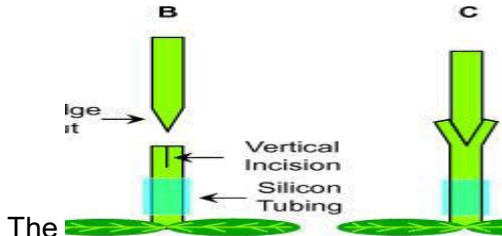
Vegetative reproduction:

It is a process of producing new individuals from different parts of the plant without the flower having a role in this process.

Kinds of reproductive reproduction:

Natural vegetative reproduction:	Artificial vegetative reproduction
Reproduction by tuber Tuber: It is a swollen part from a horizontal root or a terrestrial stem, which contains growing buds and it is used for vegetative reproduction. For example: A horizontal root as sweet potatoes.	Reproduction by cutting: It is a kind of artificial vegetative reproduction in which a part of a plant that contains growing buds known as the cut is planted. The cut: It is a part of root, stem or leaf that contains growing buds taken from a plant for reproduction. Examples: Grapes, Roses , sugar cane. Reproduction by grafting: It is a kind of artificial vegetative reproduction in which a part of plant which contains more than one bud known as scion is selected to be placed on a branch of another plant known as the stock.

Methods of grafting:

Grafting by attachment:	Grafting by wedge
<ol style="list-style-type: none">1. The scion and the stock are cut with two integrated angles.2. The scion is attached to the stock.  <p>The grafting by attachment is occurred in Mango trees.</p>	<ol style="list-style-type: none">1. The scion is prepared in the form of a wedge2. The scion is inserted into a cleft in the stock.  <p>The grafting by wedge is occurred in: Large trees.</p>

Tissue culture:

It is a process of multiplying a small part of a plant to get many identical parts.

Steps to grow a tissue from the stem of a potato plant:

1. The tissue is separated from the upper part of the stem.
2. The tissue is placed in a nutritive nutrients and hormones.
3. The new plant starts to grow till certain size.
4. The new plant is transferred to the soil to grow normally.

Revision on lesson one

1) write the scientific term:

1. The female reproductive organ of the flower ()
 2. The innermost whorl of a male flower. ()
 3. Minute cells formed inside the flower's anther ()
-

2) choose the correct answer:

1. The male flower consists of..... whorls
a. 2 b. 3 c. 4 d. 5
 2. The ovary of a flower consists.....
a. pollen grains b. anthers c. stigmas d. ovules
 3. After fertilization, the ovary develops and becomes the.....
a. fruit b. seed c. flower d. embryo
-

3) complete the following:

1. in plants takes place in two successive processes which are pollination..... then
 2. fruit has a single seed, while..... fruit has many seeds.
 3. Artificial pollination is carried out by..... Such as in.....
-

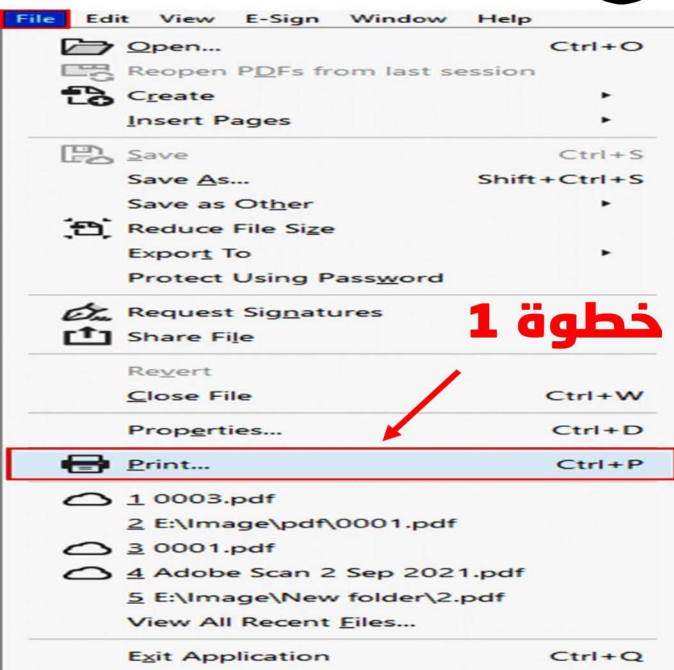
4) Give reason for:

1. Pollen grains of wind pollinated flowers are produced in a huge number.
.....
 2. Pollen grains of insects pollinated flowers are sticky or with coarse surfaces.
.....
-

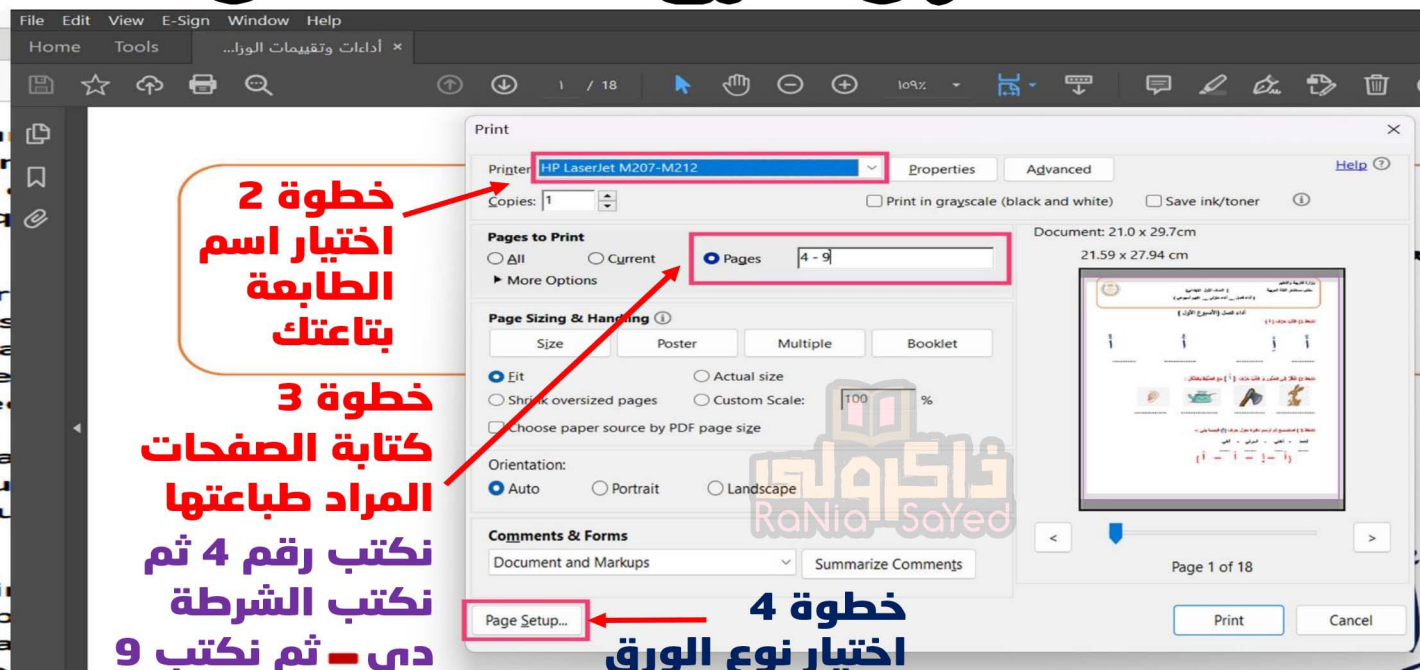
What happens when...?

1. A pollen grains falls on a flower's stigma.
.....
2. Pollen grains become mature (related to the anther)
.....

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



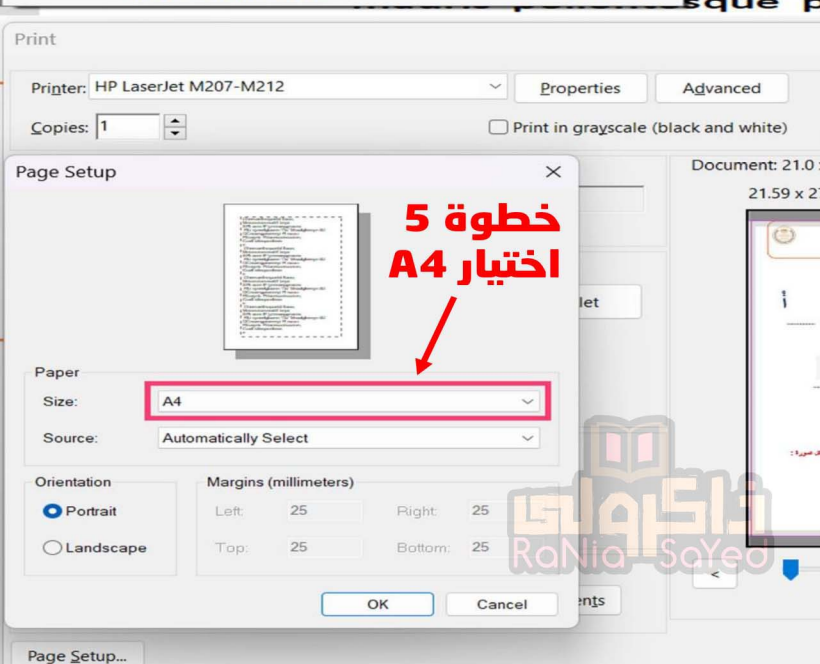
خطوة 1



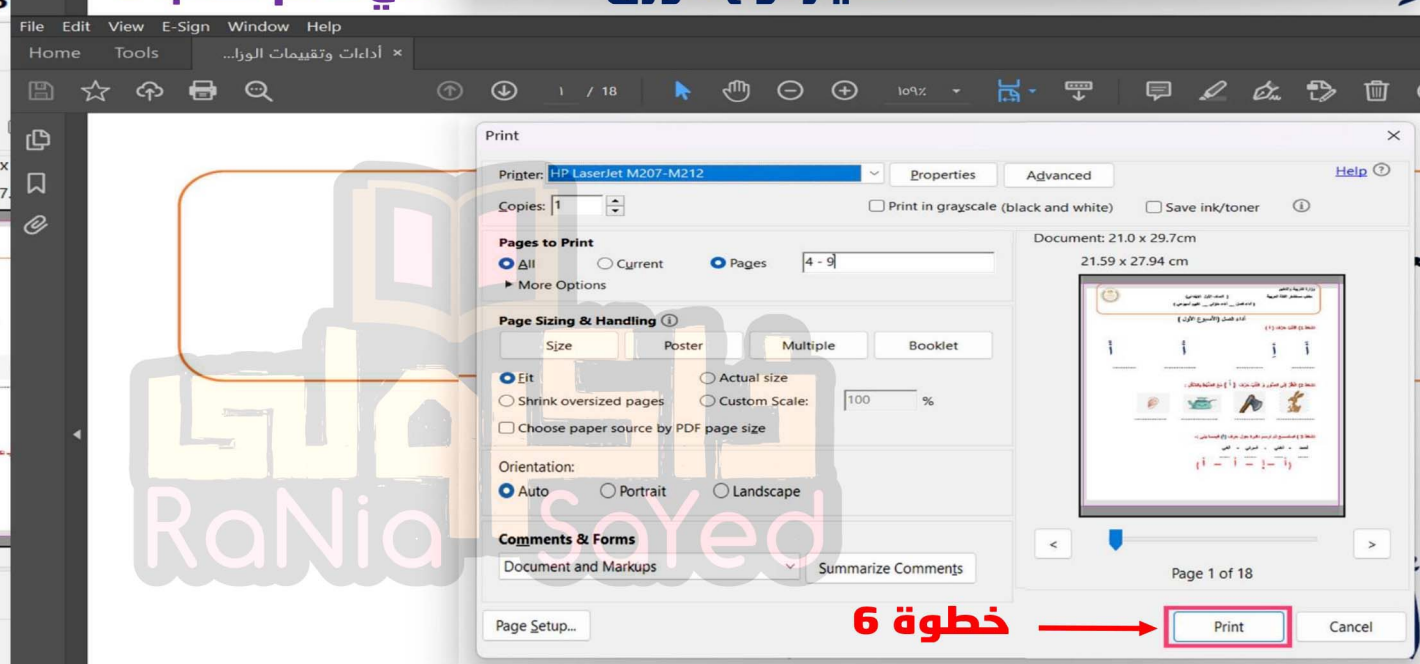
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6